TNS, Inc. *and* Oil, Chemical and Atomic Workers International Union, AFL–CIO. Cases 10–CA–17709 and 10–CA–18785

December 23, 1992

SUPPLEMENTAL DECISION AND ORDER

BY CHAIRMAN STEPHENS AND MEMBERS DEVANEY, OVIATT, AND RAUDABAUGH

The principal issues in this case[1] involve application of Section 502 of the Act in determining whether the Respondent violated Section 8(a)(3) and (1) by permanently replacing employees who engaged in a work stoppage which the General Counsel asserts was caused by the existence of ''abnormally dangerous'' working conditions. Other issues are: (1) Did the Respondent violate Section 8(a)(3) by failing to reopen its penetrator shop operations at the conclusion of the work stoppage? (2) Did the Respondent violate Section 8(a)(1) in making statements about the seniority of employees reinstated after the work stoppage? (3) Did the Respondent violate Section 8(a)(5) by withdrawing recognition of the Union as the unit employees' representative? The judge found each of the unfair labor practices alleged in the complaint.

The Board has considered the decision and the record[2] in light of the exceptions and briefs[3] and has decided to affirm the judge's rulings, findings, and conclusions only to the extent consistent with the Decision and Order.

For the reasons set forth in section I of this decision, we reverse the judge and find that the General Counsel has failed to prove that abnormally dangerous working conditions existed at the time the employees walked out. Consequently, regardless whether or not an employer may permanently replace employees engaged in a Section 502 work stoppage (an issue we do not decide), the Respondent did not commit an unfair labor practice by permanently replacing the employees in this case. Furthermore, for the reasons set forth in sections II, III, and IV below, we reverse the judge's other unfair labor practice findings and dismiss the complaint in its entirety.

I. THE ALLEGED SECTION 502 WORK STOPPAGE

A. *Factual Findings*

1. The Respondent's business and the nuclear safety regulatory framework

The Respondent, TNS, is a corporation which, at the time of the instant dispute, was engaged in the manufacture of radioactive depleted uranium (DU) metal products at a plant in Jonesboro, Tennessee. Manufacturing operations took place in two buildings—the foundry and the penetrator shop. Workers in the foundry manufactured uranium ingots known as ''derbies.'' Workers in the penetrator shop manufactured the ''GAU-8 penetrator core.''

The safety of the Respondent's use of radioactive materials in the manufacturing process is subject to the jurisdiction by the United States Nuclear Regulatory Commission (NRC). The NRC has entered into agreement with the State of Tennessee for the latter to exercise primary regulatory responsibility over facilities within that State, including the TNS plant, in a manner consistent with the Atomic Energy Act. The Tennessee

[1] On July 31, 1987, Administrative Law Judge Arline Pacht issued the attached decision. The Respondent filed exceptions and a supporting brief and the General Counsel and the Charging Party filed answering briefs. The United States, on behalf of the Department of Energy and Nuclear Regulatory Commission, filed an amicus curiae brief as did the U.S. Chamber of Commerce, the American Nuclear Insurers (ANI), the Mutual Atomic Energy Liability Underwriters (MAELU), Lapp Inc., and Lauriston S. Taylor, an individual.

[2] The hearing in this case took place between November 1983 and April 1985 consuming a total of 67 hearing days and consisting of 12,630 pages of testimony and hundreds of exhibits.

Subsequent to the hearing a panel of the Board initially deferred to private non-Board settlement agreements submitted on behalf of 56 alleged discriminatees and dismissed portions of the complaint as to them. The Board's Order approving the settlement agreements was reversed by the United States Court of Appeals for the District of Columbia. On remand from the court, the Board vacated its prior Order approving the settlement agreements and reinstated the complaint allegations pertaining to the 56 alleged discriminatees. See *TNS, Inc*., 288 NLRB 20 (1988).

[3] The Respondent's brief is 413 pages, the Charging Party's answer brief is 331 pages, the General Counsel's answer brief is 128 pages, the combined brief of amici ANI and MAELU is 87 pages, and the briefs of amici United States and the Chamber of Commerce are 13 and 34 pages respectively.

The General Counsel and the Charging Party filed motions to reject the Respondent's exceptions and brief. They allege that the Respondent failed to comply with Sec. 102.46(b) and (c) of the Board's Rules and Regulations. Specifically, they contend that the exceptions fail to designate by precise page citation the portions of the record relied on and that some exceptions improperly contain argument which, together with the supporting brief, also constitute a violation of the Board's allowable page limit for argument. With respect to the Respondent's brief, the General Counsel and the Charging Party contend that it does not contain a specification of questions involved or supporting fact and law relating to each exception and that the argument section fails to make reference to specific exceptions.

We agree that certain of the Respondent's exceptions inappropriately include argument. Accordingly, we shall grant the motions in part and disregard any argument found in the exceptions. In all other respects, the motions are denied as the Respondent's exceptions and supporting brief, although not conforming in all particulars with Secs. 102.46(b) and (c), are not so deficient as to warrant their rejection.

The General Counsel and the Charging Party also filed motions to reject the amicus brief filed by Lauriston S. Taylor, and the Charging Party filed a separate motion to reject the amicus brief of Lapp Inc. on grounds, inter alia, that the briefs attempt to add evidence to the record well after the trial proceedings have closed. We find merit in this contention and, accordingly, we grant the motions to reject the briefs.

The Respondent has requested oral argument. The request is denied as the record, exceptions, and briefs adequately present the issues and the positions of the parties.

Division of Radiological Health (TDRH) is the state agency responsible for the protection of workers from occupational radioactive hazards through the promulgation of regulations complying with Federal standards, the licensing of facilities using radioactive materials, and the inspection of facilities to assure compliance with safety standards.

In oversight of TDRH's compliance with the Federal radiation protection program, NRC officials periodically accompanied TDRH officials during plant inspections. The NRC was authorized to terminate or suspend all or part of its agreement with Tennessee if, in its judgment, such action was necessary to protect the public health and safety, or if Tennessee failed to comply with any requirement set forth in the Federal statute providing for state agreements.[4] The NRC was also authorized to suspend temporarily all or part of its agreement with Tennessee if an emergency situation arose with respect to any radioactive material that created danger requiring immediate action, and if Tennessee failed to take the necessary steps within a reasonable time to contain or eliminate the danger.[5]

TDRH had the police authority to effect a shutdown of a subject facility through license suspension or revocation. Following each plant inspection, TDRH prepared an internal agency report and issued a letter to the licensee citing any observed violations and directing corrective action. Failure to follow such directives authorized TDRH to seek a ''Commissioner's Order'' to obtain compliance. Failure to comply with a Commissioner's Order empowered TDRH to initiate a judicial proceeding to close a facility.[6]

DU poses hazards to TNS employees as both a carcinogenic and a chemically toxic material. The inhalation or ingestion of radioactive DU-dust particles exposes internal tissues to the cancer risks associated with cumulative, low-level alpha radiation. In addition, dust particles of DU, an extremely dense and heavy metal, represent a toxic threat to the kidneys.

To protect employees from the potential hazards of exposure to DU, TDRH has adopted the dose limits set by the NRC. Whole body external exposures should not exceed 1.25 rems[7] per calendar quarter or 5 rems per year. Internal lung exposure limits are 15 rems per year. TNS employees wear thermoluminescent dosimeters (TLD badges) to measure external exposures. Internal exposure levels are measured by ''in-vivo'' lung scans administered semiannually to employees.

The NRC had no official regulation governing the allowable amount of DU in the kidney. It published a proposed regulatory ''guideline'' (Reg. Guide 8.22) for urine bioassays in uranium mills. This proposed guideline[8] stated that kidney damage may occur if any single urine sample was greater than 130 micrograms of uranium per liter of urine (ug/l), or if four or more consecutive samples were greater than 30 ug/l. It set ''notice'' and ''action'' levels at 15 ug/l and 30 ug/l respectively.[9] The Respondent collected bimonthly urine specimens from its employees. In evaluating the urine bioassay data, it did not follow the legally nonbinding Reg. Guide 8.22. Instead, it applied, and TDRH approved, alternate guidelines published by the U.S. Army's ''DARCOM'' Manual, which specifically addressed exposures to DU. The DARCOM guidelines set respective notice and action levels at 50 and 100 ug/l. They did not, however, contain any danger level analogous to the 130 ug/l level set forth in Reg. Guide 8.22.

In addition to the foregoing regulations and guidelines, TDRH mandated that subject employers adhere to the concept that all exposures to DU should be kept ''as low as is reasonably achievable.'' This philosophy, known as the ALARA doctrine, operates on the principle that if an exposure level below the legal limit can be achieved without the expenditure of unreasonable funds, such levels should be adopted and maintained.[10]

Elimination of DU dust particles at their source is the best defense against exposure to its hazards. Consequently, TDRH mandated a physical engineering airborne contaminant control system using equipment shields, barrier seals, and ventilation. Acknowledging

[4] 42 U.S.C. § 2021(j)(1).

[5] 42 U.S.C. § 2021(j)(2).

[6] TDRH Official Charles West testified that it would be ''very, very difficult'' to seek license revocation.

[7] A rem is defined in the Federal regulations as a unit for measuring a dose of radiation received by an individual and which takes into account differing biological effects of different types of radiation. 10 CFR § 20.4(c)

[8] Reg. Guide 8.22 was published for notice and comment in 1978 but was never issued in final form.

[9] A notice level served the purpose of an alarm system for investigating the causes of elevated urine samples so that corrective action could be taken. Urine samples reaching action levels result in the removal of an employee from his work area pending subsequent urinalysis readings below the notice level.

[10] As defined in the Federal regulations, ALARA ''means as low as is reasonably achievable taking into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.'' 10 CFR § 20.1(c).

The ALARA concept is illustrative of a debate about whether there is an acceptable level of occupational exposure to low-level radiation, such as DU emits. Considerable expert testimony has been entered into the record in this case by proponents of opposing theories: one set of witnesses holds that there is no ''safe'' threshold level of exposure; the other set of witnesses holds that there can be a safe threshold level. Although scientific in its origin and methodology, this debate has found a second forum in tort litigation. Compare *Allen v. U.S.*, 588 F.Supp. 247 (D. Utah 1984), revd. 816 F.2d 1417 (8th Cir. 1987), cert. denied 484 U.S. 1004 (1988), with *Johnston v. U.S.*, 597 F.Supp. 374 (D. Kans. 1984).

that some radiation escape into the working environment is inevitable, TDRH followed the NRC in adopting standards set by the National Commission on Radiological Protection (NCRP) for the maximum permissible concentration (MPC) of airborne DU particles. MPC is defined as the amount of airborne radioactive material beyond which no worker is to be exposed for 40 hours per week for 13 weeks.[11] To monitor air quality, the Respondent utilized various types of air samplers throughout the plant.

In the event that engineering controls became impracticable in achieving MPC, TDRH regulations authorized the use of respiratory protection, provided that such use conformed with NRC Regulatory Guide 8.15 and its supplemental manual on respiratory protection, NUREG 0041 (NUREG). These regulations required: a written policy statement on respirator usage; selection of respirators with a protection factor (PF) greater than MPC; medical approval of and fit testing for employees wearing respirators; procedures for the proper selection, supervision, and training of personnel in respirator use; a program ensuring proper cleaning, maintenance, and storage of respirators; and notice to employees that they are free to leave their work station if their respirators malfunction or they experience discomfort.

Chapter 2 of the NUREG manual set forth the controlling standard for durational limits on the use of respirators. For operations like the Respondent's, the manual stated that ''when engineering controls are not feasible or cannot be applied, the use of respiratory protective devices may be appropriate . . . [not] as a substitute for practicable engineering controls . . . [but] while engineering controls are being instituted or evaluated.'' Specifically, the manual states that while the ''periods of time respirators are worn continuously and the overall durations of use should each be kept to a minimum . . . it is difficult to realistically assign specific time limits on respirator use because of wide variations on job requirements and in the physical capacities and psychological attitudes of individuals.'' Nonetheless, ''such factors must be taken into account in establishing a respirator program.''

2. The events at TNS

The Union has represented the Respondent's employees there since 1978. The parties negotiated a 3-year collective-bargaining agreement effective from May 1, 1978, through April 30, 1981. This contract included a brief health and safety clause, with a provision for monthly labor-management health and safety tours, and the posting on employee bulletin boards reports by union members of potential hazards needing corrective action.

[11] 10 CFR § 20.103(a)(1).

In September 1979, TDRH began regular semiannual inspections of the TNS plant. The first inspection resulted in a November 12, 1979 letter finding that the Respondent's ''activities were not conducted in full compliance with 'State Regulations for Protection Against Radiation' and certain conditions of your License'' including, inter alia:

> 1. The radiation safety program, as referenced in . . . our [state] license, did not appear to be administered adequately to provide the maximum degree of protection for your employees.
>
> . . . .
>
> 4. Personnel training in precautions or procedures to minimize radiation exposure was inadequate, contrary to [state regulations].
>
> . . . .
>
> 9. An individual was exposed to radiation in excess of applicable limits contrary to . . . [state regulations].
>
> . . . .
>
> 11. Proper notification was not made to the Department concerning the exposure of personnel to radiation in excess of applicable limits, contrary to [state regulations].
>
> 12. Proper notification was not made to personnel exposed to radiation in excess of applicable limits, contrary to [state regulations].
>
> . . . .
>
> 15. Adequate surveys for evaluating radiation hazards were not being conducted, contrary to [state regulations].

The inspection letter listed 16 violations in all and concluded with the admonition that ''it appears that a severe laxity in your facility's radiation safety program has developed. Immediate attention should be given to the upgrading of this program.''

On April 10, 1980, TDRH agents visited the TNS plant to investigate a complaint about one employee's alleged overexposure to airborne radioactive contaminants. An internal TDRH memorandum about this visit stated: ''There appeared to be conditions that such an exposure of this type could have occurred.'' A September 17, 1980, TDRH letter cited the Respondent for inadequate training of employees and deficiencies in both urine bioassay and air quality control procedures.

In the meanwhile, TDRH conducted another semiannual inspection in May 1980. On August 25, 1980, the state agency cited 11 specific areas of noncompliance. Six of these had also been noted after the September 1979 inspection. In addition, TDRH noted, inter alia, that ''Radiation and contamination levels in unrestricted areas were in excess of the limits for uncontrolled areas.''

As part of NRC's oversight function, NRC Official Edgar Ashley accompanied TDRH personnel during its

next inspection of the Respondent in November 1980. At the conclusion of the inspection, Ashley and TDRH Inspector Johnny Graves met with TNS officials. According to Ashley's notes of the meeting, Graves discussed an assortment of ''main items'' of noncompliance from past TDRH inspections and ''what had been done to correct them.'' Graves further discussed new items of noncompliance, such as the reduction in managerial rank of the TNS radiation safety officer, the absence of health staff during the night shift, an ALARA concept in need of strengthening, and the failure to post radiation warning symbols at appropriate plant entrances. These and other deficiencies were officially noted in an enforcement letter sent by TDRH to the Respondent on January 29, 1981.[12] The letter concluded that ''several of the items of noncompliance indicated above have been called to your attention in letters reflecting the result of previous inspections. It appears that sufficient effort is not being exerted to prevent the recurrence of these items.'' Nevertheless, in the ''Summary'' section of its internal report of this inspection, TDRH indicated that the Respondent's ''radiation safety program is making progress.''

Several significant events took place at the TNS plant prior to the next TDRH inspection. In January, the Respondent implemented a mandatory program of continuous, full-time respirator use in various sections of the foundry and penetrator shop in response to excessive MPC levels, which admittedly were not being controlled by the Respondent's engineering processes. The respirator program was intended to continue until approximately August, when new ventilating and shielding equipment, which had been ordered, would be installed.[13] By the winter of 1981, Local Union President John Bettis had increased the Union's emphasis on health and safety concerns and had revived the neglected contractual procedure for monthly joint labor-management tours and the posting of reports of potential hazards identified by union members. The items listed in these reports were, for the most part, ordinary industrial safety infractions unrelated to DU hazards, such as faulty electrical wiring, blocked fire lanes, leak in roof, etc. Complaints related to radiation safety consistently referred to malfunctioning or ineffective shielding and ventilation equipment, excessive dust, and unsanitary conditions in the employee clothing change rooms.

March 9 and 10 marked the last TDRH inspection visit prior to the employee walkout on May 1. This inspection, as described in the agency's internal report of April 2, was less comprehensive then previous ones and had as its ''main purpose . . . to review and check on the responses TNS had made to the last compliance letter, look at and discuss their environmental program . . . and tour the site to observe the present operations.''[14] During this inspection, TDRH officials first observed employees wearing respirators pursuant to the Respondent's mandatory full-time program. According to the internal report, ''The use-overuse of respirators was discussed . . . . I stated that studies should be conducted to look for ways to reduce use. I stated that to me the routine (full 8 hours shifts) use of masks is not to be done. Their use should be for unusual, emergency or short duration jobs.''

The TDRH internal report concluded that the ''inplant site is not as contaminated as noted several years ago . . . . There are many areas that need improvement and constant updating but it appears that at the present time no crisis or eminent [sic] threat to health and safety exist.'' Rather than citing any violations, the TDRH enforcement letter of May 4 provided ''comments, suggestions, and requirements'' to be observed. Regarding respirator use, the letter advised the Respondent to conduct studies of ways to substitute engineering safeguards for respirator use.

Also on March 10, as TDRH was finishing its last prewalkout inspection, the Union delivered the following message to the Respondent:

> [T]he employees will not return to work after April 30 until the items which are on the health and safety report have been corrected and TNS is safe and healthy for the employees to work. This includes the items from past inspections as well as items which will be listed during the April inspection.

On March 24, the parties began formal negotiations by presenting their respective comprehensive proposals for a successor collective-bargaining agreement.[15] The Respondent made a proposal which included provisions for: $1-dollar-an-hour wage increase; extension of the permissible temporary layoff period from 24 hours to 10 days; extension of the probationary period from 90 days to 180 days; and retention of the existing health and safety clause. The Union's proposal included a much lengthier health and safety clause requiring, among other things: retention of the joint union-management health and safety tours; plant inspection by union officials; independent health surveys

[12] All dates hereafter are in 1981, unless otherwise indicated.

[13] Thus, contrary to the dissent, the respirator program was not intended to be of indefinite duration.

[14] This was a special inspection, made in response to an employee's anonymous complaint concerning conditions at the TNS plant. During this visit, TDRH officials did not ask to review the Respondent's exposure records. It is thus misleading for our dissenting colleague to suggest that the Respondent ''failed to disclose'' the data contained in its files.

[15] The Respondent's chief negotiator was George Kriska, vice president of industrial relations at Aerojet General Corporation, the Respondent's parent corporation in Compton, California. Representing the Union were Local President Bettis, Business Agent Larry Abel, and, on occasion, International Union District Director John Williams.

to be paid for by the Respondent; a commitment by the Respondent to maintain adequate health and safety facilities; and a statement that no employee would be required to perform work which endangered health or which violated health and safety rules.

The parties met eight more times prior to the contract's April 30 expiration. Sessions held on March 25 and April 8 and 9 focused mainly on noneconomic issues. There was little discussion of health and safety. The Union expressed suspicions, however, that the Respondent's proposed extensions of the probationary and temporary layoff periods entailed a scheme by which the Respondent could more freely remove employees with high radioactivity exposure levels and thereby avoid responsibility for their health. Abel warned that this was a ''strike issue.''

It was not until the April 24 bargaining session that health and safety became a principal topic of discussion. This meeting began with Abel charging that the Respondent's ''safety stinks'' and that the Union had ''people in Washington working on your damn license.'' After some acrimony, the parties returned to a clause-by-clause review of their respective proposals. The Union continued to oppose the Respondent's probation and layoff proposals. The Respondent continued to oppose the Union's health and safety proposal. As the session drew to a close, Williams castigated the Respondent for requiring employees to wear respirators. Abel concluded the meeting with the warning that: ''we can 'guar-damn-tee' we are going to strike on April 30 on health and safety.''

Talks resumed the next day and centered almost entirely on the Union's protest against the full-time wearing of respirators. The Respondent attempted to justify its respirator policy as a temporary measure that was being implemented only until engineering or equipment changes could be made to reduce airborne contamination and to comply with the ALARA philosophy. When told that employees had been on respirators for about 2 months, Williams replied that ''we are not going to work under those conditions.'' He rejected the Respondent's contention that the employees are protected when wearing respirators and stated that ''if I had known about all this, we'd been on the street. If you don't think I will put you on the street, under health and safety you are mistaken.''

The next meeting was held on April 27 under the auspices of the Federal Mediation and Conciliation Service (FMCS).[16] At the behest of the FMCS mediator, discussion was restricted to noneconomic matters. Agreement was reached on a number of proposals and counterproposals, but the parties remained apart on the temporary layoff and health and safety issues. They did modify initial proposals on the probationary period issue. The Respondent proposed 150, rather than 180 working days; the Union proposed 40, rather than 30 calendar days. The Respondent indicated that it would agree to submit to an independent evaluation of its safety program and asked the Union for the names of available consultants. The Union suggested its own experts or the National Institute of Occupational Safety and Health (NIOSH).

The parties met again the next day. After a brief discussion of several proposals, including the Respondent's offer to reduce the probationary period to 120 working days, the Union declared that negotiations were a ''waste of time'' and requested that the Respondent submit its final offer the next day. As requested, the Respondent submitted a final contract offer to the Union on April 29 with an explanation of some of its terms, highlighting again that it contained an across-the-board hourly raise for all unit employees. The Union's immediate response, expressed by Abel, was that a strike was likely. He accused the Respondent of bargaining in bad faith and of ''trying to buy a damn contract'' with an offer that the Union considered was ''still $2.00 low.'' Williams added that ''our biggest problem is health and safety. You have overexposed every one at this table, and everybody at the plant.'' Referring to the health and safety strike ultimatum of March 10, Abel declared that ''we are going to have a strike tomorrow night.''

The strike option was also a subject of union and employee discussion away from the bargaining table. Employee Mike Elam testified that he told Abel in October or November 1980 that employees wanted to strike then to protest health and safety conditions. Abel advised against doing so, explaining that employees would jeopardize their jobs if they struck before the contract expired. (The contract contained a no-strike clause.) Minutes of the Union's November 1980 meeting contain the entry ''April 30 strike!'' Some employees did not wait, however. In March, a group from the penetrator shop engaged in a wildcat strike to protest the mandatory respirator program. Bettis persuaded them to return to work.

On April 4, the employees authorized a strike action. On April 29, they gathered again to discuss what they were going to do when the contract expired. Various individual employees voiced dissatisfaction with the Respondent's hourly wage raise offer and with the health and safety conditions at the TNS plant. The employees voted to strike. At midnight on April 30, virtually the entire work force of 100 men and women engaged in a work stoppage.

The Respondent made no attempt to continue operations during the first 3 months of the strike. While the plant sat idle, it continued to negotiate with the Union and submitted to inspections by TDRH and by Radiation Management Consultants (RMC), a private consulting firm hired by the Respondent. TDRH con-

[16] All subsequent negotiations were mediated by FMCS.

ducted a 2-day inspection on May 5–6 in response to a telegram sent by the Union on April 29 warning of ''eminent danger'' [sic] due to high urine counts received by some employees and the mandatory use of respirators for ''the full 8 hour shift.'' RMC conducted its investigation on May 13 and 14.

RMC sent its report to the Respondent on May 29. The report found that air concentrations within the plant were ''slightly in excess of MPC'' and that the Respondent's engineering controls were inadequate to reduce airborne contamination. The report found particular fault with the mandatory respirator program, which was deemed to be too long in projected duration (until August, when new ventilation and shielding equipment was to be installed) and not in compliance with the requirements of Reg. Guide 8.15 relating to employee training and the proper use, fit, cleaning, storage, and maintenance of respirators. Although indicating that lower urine bioassays began to occur after implementation of the respirator program, RMC stated that the failure of bioassay levels to fall even lower supported the inference that the discomfort of prolonged shift-long respirator use had led employees ''to cheat on the wearing of masks.''

The RMC report's conclusion was mixed. While noting ''many areas of noncompliance [which] should be of great concern to management'' and a ''lack of management commitment to a radiation safety program,'' RMC also found ''DU is a rather innocuous radioisotope and with exposure limits to radiation and airborne concentrations based on 50 years of exposure, short periods of exposure to radiation or airborne concentrations slightly in excess of MPC presents no real hazard.''

One week later, on June 4, TDRH reported on its May 5–6 inspection. In a one-page letter to the Respondent, TDRH identified virtually the same deficiencies found by RMC, i.e., inadequate engineering controls and airborne concentrations of DU dust exceeding MPC.[17] In its separate reply to the Union's April 29 complaint, TDRH stated that ''some employees have been 'relocated' because urine sample results exceeded the action levels . . . [which] appear to be in line with those utilized at other facilities within the industry . . . [and which] appear to have been set at values below those levels at which hazards to employees have been shown to exist.''[18] As for the allegation of excessive respirator use, TDRH told the Union that it was requiring the Respondent to establish the basis for such use and to explain why engineering controls were inadequate to reduce concentrations of airborne DU.

On June 3, the parties met for the first bargaining session since the beginning of the strike. The Union made a health and safety proposal that the Respondent discontinue respirator use by December 1 and hire an outside consultant to make a study of TNS plant safety. In response to the respirator use deadline, the Respondent acknowledged that it had ''areas where air contamination is outside the limits'' and explained that it was currently making efforts to correct its engineering controls. It declined to commit to a specific deadline for termination of the mandatory respirator program until such corrections were made. With respect to the suggestion of an independent inspection, the Respondent failed to disclose that it had commissioned the RMC study. It stated that it was amenable to an inspection by an outside consultant if the Union split the cost. The Union refused, claiming it could not afford this arrangement.

By the end of June, the Respondent decided to resume production in August. Hoping to avoid the necessity of hiring replacements, TNS officials met with the Union's International president during the weekend of July 4 in an unsuccessful attempt to reach a settlement to the work stoppage. On July 8, the Respondent notified its employees by letter that it would begin hiring permanent replacements on July 16. The letter further stated that TNS had ''been thoroughly inspected and advised that our employees face no imminent health-safety danger.''

On July 16, the parties met again. This session started with a closed-door meeting between the Union and the Federal mediator. When bilateral discussions resumed, the Union accepted the Respondent's original $1-an-hour-wage raise proposal. It soon became clear that the only two issues dividing the parties were the Respondent's 10-day layoff proposal and the Union's health and safety proposal. Abel's ''biggest fear'' was that ''the 10-day layoff is completely tied to health and safety'' because of the possibility that the proposal would be used by the Respondent to put overexposed workers ''out to pasture.'' In Abel's view, ''if these items were straightened out, we might have a contract.'' Although there was some movement on the layoff issue, the parties were unable to conclude an agreement.

The parties' final negotiation session in 1981 took place on September 3. The only subject discussed was the number of bargaining unit jobs remaining after the hiring of permanent replacements. The Respondent informed the Union that no vacancies existed. The meeting ended with dim prospects for settlement.

[17] The letter did not cite the Respondent for overuse of respirators even though the underlying TDRH report echoes a prior report in finding that ''there were individuals in the penetrator shop who were being required by management to wear respirators for the duration of 8 hour working shifts'' and that the Respondent admitted that ''there were eleven other areas . . . as requiring additional respiratory protection'' but not, according to the Respondent, for an entire shift.

[18] TDRH apparently was referring to DARCOM's action levels, rather than those set out in Reg. Guide 8.22.

Accompanied by an NRC official, TDRH investigated the TNS plant over a 3-day period in mid-October and another 2 days on December 17 and 18.[19] In a letter dated January 28, 1982, the Respondent was cited with a list of familiar violations, including air contamination above MPC in the foundry throughout the last and first quarters of 1981 and the failure to notify employees of ''their exposure to excessive levels of airborne radioactivity.'' In a concluding paragraph, TDRH stated ''it appears that your safety program was inadequate to protect workers from unnecessary radiation.'' The Respondent was urged to direct its attention ''toward revamping [its] program . . . to insure that employees will no longer be unnecessarily exposed to radiation.''

At the request of TDRH, NIOSH investigated the Respondent's facilities on November 20 and December 14–17 in order to provide technical assistance in evaluating potential health hazards of exposure to DU at TNS. NIOSH examined TNS employees' TLD readings of external whole body exposure, in-vivo lung scans, and urine bioassays. NIOSH found that ''whole body doses for production workers from 1975 to 1980 ranged from 1.06 rems to 2.16 rems,'' with none having ''ever exceeded 5 rems per year whole body dose'' since 1978.[20] NIOSH concluded that these doses, ''while for the most part within legal limits, were higher than doses observed among workers in other parts of the uranium fuel cycle and other U.S. nuclear industries.'' From in-vivo testing data, NIOSH determined that between 1978–1981 ''32% of the hourly work force had a yearly dose to the lung of 5.3 to 15.9 rems per year'' which, although within ''the accepted radiation guidelines allow[ing] a maximum annual lung dose of 15 rems,'' represented ''an inadequate margin of safety.'' NIOSH did not make any independent conclusion based on these readings.

With respect to urine bioassays, which NIOSH ''considered the critical factor in calculating safe [internal] exposure levels,'' it recommended that TDRH and TNS follow the nonmandatory NRC Reg. Guide 8.22 notice and action levels. It also found that between 1977 and 1981 an annual average of 52 percent of the TNS production work force had one or more bimonthly urine samples greater than the higher DARCOM notice levels of 50 ug/l and 19.5 percent had one or more samples greater than 100 ug/l. NIOSH concluded that

> [U]rine uranium concentrations exceeded NRC guidelines for bioassay at uranium mills, but not the less stringent [DARCOM] standards enforced by the state. Because the NRC guidelines are set to protect workers from the toxic effect of uranium to the kidneys, we may infer that that there is some possibility of renal damage among TNS workers who had urine uranium concentrations exceeding this level. . . . Since the majority of TNS workers had very short durations of employment it is unlikely that they have measurably altered changes in renal function. We have therefore concluded that a medical study of renal function in this population would not be useful.

The situation at the TNS plant was the subject of a Congressional hearing on December 8. Among the witnesses at the hearing were TDRH Director William Graham and NRC Office of State Programs Director G. Wayne Kerr. Graham reviewed his agency's actions vis-a-vis TNS. In specific reference to the mandatory respirator program, he stated

> Since the levels of dust monitored in the penetrator shop exceeded the maximum allowable by only a small fraction, we felt fairly confident that workers were being protected, provided respirators were being worn correctly and consistently. The effective use of personal protective equipment—and I think this has been demonstrated here today in testimony—such as respirators is difficult for the Division to monitor and the company to enforce.[21]

Kerr generally reviewed NRC's authority and the ''Agreement State'' program. He specifically described NRC's oversight of the TDRH program and its handling of the TNS safety situation. He concluded that ''we believe that Tennessee is carrying out its regulatory responsibilities in the TNS case in an appropriate manner.''[22] Kerr also commented about references made during the hearing to NRC regulatory guides. He noted that each guide specifically states that ''[r]egulatory guides are not substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the commission.''[23] Kerr also stated that uranium mill bioassay levels described in NRC Reg. Guide 8.22 were ''inappropriate to the [TNS] case being discussed.''[24]

On February 15, 1982, 10 months after the strike began, the Union submitted to the Respondent an unconditional offer to return to work on behalf of the

[19] As noted in the internal report, ''the primary purpose of the visit was to attempt to collect enough data to determine each employee's exposure to radiation and radioactive material at least per quarter over the past year (October 1, 1980, to September 30, 1981).''

[20] Findings pertaining to whole body exposure in 1981 were not included.

[21] H.R. Rep. No. 102, 97th Congress, 1st Sess. at 232 (''Gore Report'').

[22] Id. at 245.

[23] Id. at 246.

[24] Id.

employees. The Respondent replied that there were no job openings at that time as all positions were currently held by permanent replacements. The parties continued to meet and negotiate until, on May 3, 1982, the Respondent received a decertification petition signed by 70 of the 73 employees then working at the plant stating they no longer wished to be represented by the Union. Soon thereafter, the Respondent withdrew recognition from the Union and since that time has refused to bargain.

B. *Contentions of the Parties*

The General Counsel and the Charging Party Union submit that the employees ceased work because they believed in good faith and on an objective basis that conditions at their workplace had become abnormally dangerous, within the meaning of Section 502 of the Act, because of hazards associated both with exposure to DU and with the mandatory respirator program. The General Counsel and the Union further contend that employees who quit work pursuant to Section 502 have rights and privileges equivalent or superior to unfair labor practice strikers; therefore, when the Respondent advised its employees that it was going to hire permanent replacements and thereafter refused to reinstate the employees immediately after their unconditional offer to return to work, it violated Section 8(a)(3) and (1).

The Respondent contends that the employees were engaged in an economic strike in support of the Union's position in negotiations for a successor agreement and that they were therefore not engaged in a good-faith safety protest within the meaning of Section 502. Furthermore, the Respondent and amici United States, ANI, and MAELU contend that the radiation exposures received by the employees were acceptable under Federal and state regulatory standards to which the Board should defer and thus, by definition, abnormally dangerous conditions within the meaning of Section 502 did not exist at the plant. Finally, the Respondent and amicus Chamber of Commerce submit that, even if abnormally dangerous conditions did exist, Section 502 operates solely to exempt employees from adherence to a contractual or statutory no-strike provision when they cease work because of such conditions; it does not create a separate employer unfair labor practice for maintaining unsafe conditions, nor does it confer upon employees engaged in such a work stoppage the right to reinstatement immediately upon their unconditional offer to return to work.

C. *The Judge's Decision*

The judge found that the employees ceased working in a good-faith protest of working conditions which, on the basis of objective evidence, were abnormally dangerous within the meaning of Section 502. Preliminarily, she expressed the view, inter alia, that under the applicable objective evidence test: the General Counsel must prove that employees' ''perceptions were reasonably based on verifiable grounds,'' rather than prove danger-in-fact; an employer's failure to take available abatement actions may be a factor; and the applicable regulatory standards, including the ALARA concept, were relevant, but there is no prima facie requirement to prove that the Respondent consistently exceeded those standards. She then identified the following as objective evidence of abnormally dangerous working conditions:

> (1) air quality at the facility exceeded MPC at 11 work stations for at least the last quarter preceding the strike; (2) the protracted use of respirators by a substantial number of employees was deleterious to their health; (3) the employees' average whole body uranium exposures were far greater than those typical for the nuclear industry; and (4) that repeated and excessive uranium-in-urine levels indicated serious risk of kidney damage. I further conclude that these conditions came about and were not soon abated because Respondent failed to comply diligently with governmental codes prescribing sound health physics practices.[25]

The judge further concluded that although employees who engage in a Section 502 work stoppage are not strikers, the provision bestows on them ''special protections,'' akin to those enjoyed by unfair labor practice strikers, which prohibit their suffering ''any penalty'' including the penalty of permanent replacement. Accordingly, she found that by permanently replacing and refusing to reinstate the employees when they offered to return to work without condition, the Respondent violated Section 8(a)(3) and (1).

D. *Analysis*

1. Failure to meet test for ''abnormally dangerous''

Contrary to the judge, we find that the General Counsel has failed to prove that, at the time of the May 1, 1981 employee walkout at TNS, the totality of available evidence supplied a sufficient basis for a reasonable good-faith belief that the employees' working conditions were ''abnormally dangerous'' within the meaning of Section 502. Thus, the General Counsel has failed to show that the TNS employees reasonably believed, on the basis of objective evidence, either that conditions at the Respondent's plant had changed to an extent necessitating a walkout or that the employees' cumulative exposure to DU had reached the point at which further exposure would have posed unacceptable

[25] Judge's decision, infra at 92–93. (CHANGE PP. NOS.!!!)

hazards. In the latter regard, we give substantial weight to the fact that TDRH never sought, or even considered seeking, measures available to it that could have required any shutdown of all or part of the TNS operations. Because we find that Section 502 does not cover the May 1 walkout, we need not pass on whether an employer can lawfully hire permanent replacements for employees who are engaged in a Section 502 work stoppage.

As we explain in more detail below, in applying the ''abnormally dangerous'' clause of Section 502 to employee walkouts assertedly prompted by conditions in industrial operations that use or generate nuclear materials posing radioactive hazards, we do not, contrary to the suggestion of our dissenting colleague, require the proponents of Section 502 coverage to prove that conditions were *in fact* abnormally dangerous at the time of the walkout or that employees were actually manifesting physical injury or on the verge of doing so as a result of conditions in the plant. We recognize that the issue is more complex than that presented by the case of, for example, an apparently imminent mine roof collapse.

In applying our test, we also do not, contrary to our dissenting colleague's suggestion, abdicate to TDRH or any other agency our responsibility to decide the legal and factual issues in this case. We simply take the position that, in a highly regulated industry like that involving nuclear materials, an individual cannot form a reasonable belief concerning whether conditions in a particular plant are abnormally dangerous without giving due consideration to the views of the agency that is charged under the Federal scheme with monitoring safety conditions, that is empowered to secure shutdowns or changes in plant procedures if the safety of the workers requires it, and that is required to consider complaints filed by any person about safety conditions in the plant. We see this as essential lest we allow the invocation of Section 502 as an end run around the statutes directly applicable to worker safety in this industry, at least where, as here, there was no evidence that the monitoring agency was failing to do its job and no objective evidence at the time of the walkout from which a reasonable person could conclude that hazards were being actively concealed from the monitoring agency.

In this regard, we are struck by the undisputed evidence that the Union, as the employees' representative, stated an intention to strike over safety issues as early as March 10, but evidently perceived no need at that time either to walk out immediately or to seek answers concerning its complaints from TDRH, the agency with power to undertake unannounced inspections and to require the submission of safety data. It was not until April 29—virtually on the eve of contract expiration and the walkout—that the Union sent a telegram to TDRH regarding the complaints that were said to justify the strike (which had been formally authorized by the employees on April 4). We see nothing occurring or made known to the Union and the employees between March 10 and May 1 that provided a reasonable basis for converting a belief that conditions were not abnormally dangerous (i.e., so dangerous as to call for immediate departure from the workplace) into a belief that they were. Indeed, although one of the Union's chief complaints concerned the Respondent's implementation of the respirator program, as late as June 3 the Union was willing for the use of respirators to continue until December 1. In this respect, not only the Union's actions, but even its very bargaining position, are inconsistent with our dissenting colleague's arguments.

a. *The meaning of ''abnormally dangerous conditions'' in light of the legislative history of Section 502*

We begin with the language of the statute. Added as part of the l947 Labor Management Relations Act, commonly called the Taft-Hartley Act, Section 502 reads in full:

> SAVING PROVISION
>
> Sec. 502. Nothing in this Act shall be construed to require an individual employee to render labor or service without his consent, nor shall anything in this Act be construed to make the quitting of his labor by an individual employee an illegal act; nor shall any court issue any process to compel the performance by an individual employee of such labor or service, without his consent; nor shall the quitting of labor by an employee or employees in good faith because of abnormally dangerous conditions for work at the place of employment of such employee or employees be deemed a strike under this Act.

We are concerned here with interpreting the final clause of Section 502. Its plain meaning is that one or more employees who quit labor because of abnormally dangerous conditions for work are not engaged in a strike. Neither Section 502 nor its legislative history offers any definition of ''abnormally dangerous.'' Senate debate culminating in proposal of the historical antecedent of the final clause of Section 502 indicates that Congress focused on the simple concept of protecting employees from being compelled to work by no-strike sanctions in situations of obvious and immediate physical danger, such as one in which a coal mine explosion is imminent.[26] The task of defining the

[26] The origin of the final clause of Sec. 502 is traceable to Senate floor debate about the Case bill, legislation which was passed by Congress but successfully vetoed by President Truman in 1946. Provisions of that bill would have imposed mandatory mediation and

term ''abnormally dangerous'' has therefore been left to the Board and reviewing courts.

In *Redwing Carriers*,[27] the Board stated:

> We are of the opinion that the term contemplates, and is intended to insure, an objective, as opposed to a subjective, test. What controls is not the state of mind of the employee or employees concerned, but whether the actual working conditions shown to exist by competent evidence might in the circumstances reasonably be considered ''abnormally dangerous.''

The Supreme Court approved the Board's objective evidence test in *Gateway Coal Co. v. Mine Workers*, 414 U.S. 368 (1974). The Court stated ''that a work stoppage called solely to protect employees from immediate danger is authorized by Sec. 502,''[28] but it disagreed with the lower court majority's conclusion ''that an honest belief, no matter how unjustified, in the existence of 'abnormally dangerous conditions for work' necessarily invokes the protection of Sec. 502.''[29] Instead, quoting from the dissenting opinion below and citing *Redwing Carriers*, inter alia, the Court held that a party seeking to prove coverage by Section 502 ''must present 'ascertainable, objective evidence supporting its conclusion that an abnormally dangerous condition for work exists.'''[30]

As we discuss further below, the definition of ''abnormally dangerous'' does not turn on a standard degree of deviation from a single norm of industrial safety. Evaluation of objective evidence of abnormally dangerous conditions must therefore proceed on a case-by-case basis.

Consistent with the manifest congressional intent of drawing a narrow ''saving'' exception to the broad definition of the term ''strike'' in Section 501(2) of the Act,[31] and any consequent no-strike obligation imposed by law or by contract, the burden of objective proof imposed under Section 502 is a heavy one. Indeed, in over 40 years since the passage of Section 502, the Board has found abnormally dangerous working conditions in only six contested cases.[32] Each of those cases involved objective proof of tangible and immediate physical dangers which were substantially greater than those presented by normally existing conditions at the subject workplace.

In the present case, we address for the first time the applicability of Section 502 to the intangible threat of occupational exposure to carcinogens and chemical toxins. Although there is no indication that Congress had this kind of hazard in mind in 1947, we find that the protective intent expressed through Section 502 is applicable to hazards such as those posed by the use of DU at the TNS plant. Objective proof of abnormally dangerous conditions in this context is complicated, however, by the insidious nature of invisible hazards which may not result in ascertainable physical injury for years.

We reject any notion that objective proof of abnormally dangerous conditions in this context must include a showing of present injury by cancer or poisoning,[33] and we agree with the judge that the General Counsel need not prove abnormal danger-in-fact under the *Gateway Coal* test. On the other hand, the mine disaster paradigm which motivated the proposal of the Case bill's ''abnormally dangerous'' language, the Court's references in *Gateway Coal* to ''immediate danger'' and ''identifiable, presently existing threat,''[34] and Board precedent applying the objective test under Section 502 all support the view that there must be some manifest *present* need for employees to quit the workplace. Consistent with that requirement, we find that a party attempting to demonstrate Section 502 coverage in the context of employee exposure in the workplace to radioactive and/or toxic substances may do so by showing that the employees reasonably believed, on the basis of objective evidence,[35] *either* (1) that inherently dangerous conditions in the subject workplace had changed significantly for the worse, so as to impose a substantial threat of imminent danger if exposure were continued at the time the employees began to withhold their services, *or* (2) that the cumulative effects of exposure to those substances had

---

cooling-off periods for parties engaged in certain types of labor disputes. Individuals striking during the cooling-off periods would have forfeited their status as employees under the Act. As a result of expressions of concern for employees confronted with abnormally dangerous working conditions during the cooling-off period, language identical to the final clause of Sec. 502 was added to the Case bill. Legislative History of the Case bill; H.R. 4908, 79th Cong., 2d Session, Cong. Rec.—Senate, 5678–5679, 5680–5681, 5711–5712, 5794.

[27] 130 NLRB 1208, 1209 (1961), mod. 137 NLRB 1545, enfd. sub nom. *Teamsters Local 79 v. NLRB*, 325 F.2d 1011 (1963), cert. denied 377 U.S. 905 (1964).

[28] 414 U.S. at 385.

[29] Id. at 386.

[30] Id. at 387 (citation omitted).

[31] That section states:

> (2) The term ''strike'' includes any strike or other concerted stoppage of work by employees (including a stoppage by reason of the expiration of a collective-bargaining agreement) and any concerted slowdown or other concerted interruption of operations by employees.

[32] *Richmond Tank Car*, 264 NLRB 174 (1982); *Combustion Engineering*, 224 NLRB 542 (1976); *Roadway Express*, 217 NLRB 278 (1975); *Fruin-Colnon Construction Co.*, 139 NLRB 894 (1962), enf. denied 330 F.2d 885 (8th Cir. 1964); *Philadelphia Marine Trade Assn.*, 138 NLRB 737 (1962), enfd. 330 F.2d 492 (3d Cir. 1964), cert. denied sub nom. *Longshoremen ILA v. NLRB*, 379 U.S. 833 and 841 (1964); *Knight Morley Corp.*, 116 NLRB 140 (1956), enfd. 251 F.2d 753 (6th Cir. 1957), cert. denied 357 U.S. 927 (1958).

[33] Such a requirement would be inconsistent with long-settled Board law. See, e.g., *Roadway Express*, supra, 217 NLRB at 280; *Fruin-Colnon*, supra, 139 NLRB at 905; *Knight Morley Corp.*, supra, 116 NLRB at 144.

[34] 414 U.S. at 385 and 386.

[35] See *Red Wing Carriers*, supra.

reached the point at which any further exposure would pose an unacceptable risk of future injury to employees.

The first prong of our test reflects the following reasoning set out by the Board in *Anaconda Aluminum Co.*, 197 NLRB 336, 344 (1972):

> Absent the emergence of new factors or circumstances which change the character of the danger, work which is recognized and accepted by employees as inherently dangerous does not become ''abnormally dangerous'' merely because employee patience with prevailing conditions wears thin or their forbearance ceases.

Our second prong allows for the fact that, in the case of exposure to radioactive or toxic substances, an employee's entry into the zone of ''abnormally dangerous'' conditions, e.g., exposure levels, may in some circumstances be foreseen as occurring not as a result of any change in the workplace but simply as the result of crossing a cumulative exposure threshold.[36]

As discussed below, we find that the General Counsel has failed to establish the applicability of Section 502 under either of the foregoing alternative tests. First, there is insufficient proof that the employees reasonably believed that the dangers which were inherent in the TNS workplace had changed materially for the worse at or around the time of the walkout. Second, the record does not indicate that the TNS employees reasonably believed, on the basis of objective evidence, that their cumulative exposure to DU had reached a level at which any further exposure would have been unacceptably risky. As indicated at the outset, in evaluating the reasonableness of the employees' professed belief, we find of some significance the fact that the employees could have consulted TDRH before the walkout and that it was the view of that monitoring agency, as well as the NRC, that conditions at the TNS plant, although plainly in need of improvement, were not so dangerous as to require removal of employees from the plant pending corrective action by the Respondent.

b. *Application of first prong of the ''abnormally dangerous'' test in this case*

In applying the first of our two alternative means of establishing Section 502 coverage, we note that the inherent dangers of working with DU, even in a state-of-the art environment of physical engineering controls, are undisputed. Indeed, evidence in this case concerning the no-safe-threshold view of occupational exposure to low-level radiation, and the related ALARA cost-benefit concept serves more to underscore those inherent industrywide dangers than to prove the abnormality of dangerous conditions at TNS. As a normal working condition, employees engaged in the kind of production work performed at the TNS plant prior to the work stoppage faced a greater likelihood of cancer or kidney damage than most other worker populations. Furthermore, in accord with *Anaconda Aluminum*, supra, the appropriate benchmark of normalcy for evaluating the claim of abnormal danger is set by the ''prevailing conditions'' at the TNS plant, rather than by conditions in the nuclear industry at large or in the industrial subgroup of employees working with DU. This is true even if the existing dangers of the subject workplace are significant.[37]

It is apparent that the DU-exposure prevention program at the TNS plant was less than state-of-the art. For several years prior to the May 1, 1981 work stoppage, the Respondent's facility had a level of airborne DU-contaminants, and consequent employee exposure, higher than it could have been had the Respondent faithfully followed the ALARA concept.[38] The degree of exposure levels remained relatively constant, however, although data for whole body radiation exposures and uranium in urine had shown a gradual upward trend since 1979.

In the few months preceding the work stoppage, there were no significant new factors or circumstances changing the character of the prevailing danger involved in working at the TNS plant. In this regard, we disagree with the judge's characterization of the Respondent's mandatory respirator program, introduced in January 1981, as a change constituting independent evidence of abnormal danger. The prolonged wearing of respirators created discomfort for certain employees and was an inadequate long-term substitute for physical engineering controls against DU-exposure hazards, particularly in light of the Respondent's failure to comply with NRC Regulatory Guide 8.15 and the supplemental NUREG manual. But the respirator program did not itself create or exacerbate any health and safety

[36] We also allow for the possibility of exceptional circumstances in which the place of employment presents abnormally dangerous conditions that are evident virtually from the time that employees begin work there. In such circumstances, however, employees acting on a reasonable belief would not stay long in the workplace. As explained below, we would not find, under any assumption-of-the-risk theory, that a Sec. 502 walkout would be unavailable to such employees who walked out as soon as objective evidence of abnormally dangerous conditions was apparent.

[37] See, e.g., *NLRB v. Fruin-Colnon Construction*, supra, 139 NLRB at 904; *L. E. Meyers Co.*, 270 NLRB 1010, 1011 (1984); *Anaconda Aluminum*, supra, 197 NLRB at 344. Of course, under our second test (sec. c, infra), the General Counsel may seek to establish that at some point the existing conditions would likely produce whole body radiation exposures and urine bioassay levels that would cross an abnormal danger threshold. As we explain below, however, there is no objective evidence on which the employees could have concluded that they were closely approaching such a threshold when they walked out on May 1.

[38] The substandard conditions listed in the dissent, e.g., leakage and spillage of greensalt, were among the factors that contributed to the elevated exposure levels.

hazards.[39] Indeed, the RMC report, which was highly critical of the respirator program, indicated that it may have contributed to a *reduction* of urine bioassay levels. Finally, and perhaps most significantly for the purposes of judging whether the employees reasonably believed—or even actually believed—that the mandated use of the respirators created an abnormally dangerous condition as of May 1, it is undisputed that on June 3, the first negotiating session after the strike began, the Union's health and safety proposal included a proposed requirement that would have permitted the Respondent to continue using respirators until *December 1*.

In the judge's opinion, which is evidently shared by our dissenting colleague, the Respondent's administration of its health and safety program was also a factor in considering whether the continuing level of DU-exposure hazards was abnormally dangerous. Indeed, the crux of the judge's decision appears to be her concern that the Respondent did not take timely, reasonable, and available corrective measures in reaction to governmental directives and a substantial body of scientific opinion indicating a direct incremental correspondence between DU-exposure levels and the incidence of cancer or kidney damage. Although, like our colleague, we share the judge's disapproval of the Respondent's conduct in maintaining inherently dangerous working conditions that could reasonably have been made safer, we find that they have misconstrued the precedent interpreting the narrow scope and protective intent of Section 502.[40] Contrary to the judge and our colleague, the Respondent's mere maintenance of prevailing conditions in the TNS workplace did not transform existing dangers there into abnormal dangers on or around May 1, 1981, absent either some ''ascertainable, objective proof'' that employees confronted a substantial change in the risk of cancer or kidney injury from DU exposure if they remained at work or proof under our alternative test that cumulative exposures had reached a critical threshold. There is no such evidence. The only change of consequence occurring on or near the date of the work stoppage was the expiration of the collective-bargaining agreement at midnight on April 30, an event irrelevant to workplace safety, and as we explain in section c below, the record evidence is also insufficient to satisfy the second test.

We also find the conduct of the employees and their Union in the months preceding the strike relevant in determining whether they had a reasonable belief that significant changes in working conditions rendered working conditions abnormally dangerous as of May 1, when they walked out. In October–November 1980, and again in March 1981, some employees considered striking to protest working conditions. They were dissuaded from doing so by union officials. At least by January 1981, those officials, particularly Local Union President Bettis, were more specifically aware of the invisible dangers attendant to the physically manifest working conditions at TNS. They repeatedly referred to health and safety problems in monthly labor-management plant tours and in contract negotiations. Although periodically threatening strike action upon expiration of the contract, they made no attempt to relate May 1 to any objective evidence that conditions by that date would become unreasonably dangerous. Of equal importance, they made no effort until virtually the eve of the strike to bring TDRH into the plant to make an inspection that might have confirmed any suspicions.

In sum, we find that the General Counsel has failed to show that the employees reasonably believed, on the basis of objective evidence, that abnormally dangerous working conditions existed on the date of the walkout, as measured by reference to the inherently dangerous conditions which had prevailed at the TNS plant for a long time. There were no ''new factors or circumstances'' which changed the character of the prevailing danger on May 1. All that occurred on that date was expiration of the contract and a walkout by employees in protest of conditions that, at least in one important respect (urine bioassay levels), may actually have been improving.

c. *Application of second prong of the ''abnormally dangerous'' test in this case*

Although the General Counsel has not shown that the employees reasonably believed that any material change in the degree of danger inherent in working at the TNS plant had occurred at or near the time of the walkout, that failure alone is not dispositive of the Section 502 issue. As we have indicated, in a workplace such as the TNS plant, at which employees are subjected to repeated exposure to radioactive or toxic substances, the cumulative exposure level may build, over time, to a point at which further exposure may pose unacceptable risks to the work force, even though

[39] There was, for instance, no objective evidence that the mandatory respirator program created abnormal cardio-pulmonary risks.

[40] We note that the judge's rationale would have dictated a different result in *Gateway Coal* itself. As characterized by dissenting Justice Douglas, that case involved ''the most dangerous occupation in America,'' as measured by the Bureau of Labor Statistics, and a mining operation classified by the United States Bureau of Mines as ''especially hazardous.'' Congressional testimony about prevailing conditions at this mine had detailed a history of supervisory negligence in safety matters. 414 U.S. at 388. Mining employees engaged in a work stoppage to protest the employer's reinstatement of two foremen who faced criminal charges of falsifying mine airflow records essential to the monitoring of deadly methane gas levels in the mine. The Court majority nevertheless found that the work stoppage was not protected by Sec. 502, because the Union's claim did not concern ''some identifiable, presently existing threat to the employees' safety.'' Id. at 386.

no material change in the employees' working conditions may have occurred. In such a case, the fact that the employees may have worked under inherently dangerous conditions for a long time without protesting or quitting work would not preclude a finding that the Section 502 protection applies. It is likely that only by ''accepting'' such conditions over a period of time would employees reach the levels at which further exposure would pose excessive risk. To deny employees the protection of Section 502, even though they have reached a critical exposure threshold because they had previously ''accepted'' dangerous conditions, would be a *Catch-22* result that obviously would vitiate the purposes of Section 502.

For the foregoing reasons, we hold that the General Counsel also may demonstrate the presence of abnormally dangerous conditions by showing that employees had a reasonable belief, grounded in objective evidence, that such a danger threshold had been reached. In this case, however, the General Counsel has made no such showing. The record does not even establish what that threshold level of exposure is, let alone that the employees reasonably believed that it, or any such level, was reached or exceeded at the TNS plant at any material time.

In assessing the employees' objective grounds for a reasonable belief on this matter, we are of the view, as noted at the outset, that we should take account of the actions of the agencies charged under the nuclear safety program originally established under the Atomic Energy Act with the responsibility for monitoring radiation hazards in plants such as TNS. As recited in our statement of facts, this regulatory authority is vested in the NRC and in ''agreement state'' agencies such as TDRH. We give substantial weight to those agencies' assessment of the dangers of DU-exposure at the TNS plant under relevant safety regulations.[41] We recognize that there is no exact equivalent of the term ''abnormally dangerous'' working conditions in the NRC/TDRH regulatory lexicon. Consequently, the critical inquiry in evaluating the investigatory findings and recommendations of those agencies is whether they ever indicated that conditions at the TNS plant were so unsafe as to require removal of employees from the plant on May 1, 1981, or even serious consideration of taking such action.[42] The record is bereft of any such evidence.

As detailed in the preceding narrative of events, TDRH officials conducted seven separate investigations of nuclear safety conditions at the TNS plant from September 1979 through December 1981. One of these investigations took place on March 9 and 10, 1981, less than 2 months prior to the May 1 work stoppage. Another investigation took place on May 5 and 6, in direct response to the Union's complaints. Although some data relevant to contemporaneous employee exposure levels were not considered during the investigations that were conducted close to the date of the work stoppage, supplemental data covering the immediate prestrike period were reviewed during the complementary, extensive investigations by TDRH and NIOSH in late 1981.[43]

Viewed in conjunction, the testimony of agency officials, internal agency memoranda, official reports, and letters based on the aforementioned investigations provide objective evidence of the agencies' expert view that on May 1: (1) numerous aspects of the Respondent's safety practices remained in noncompliance with agency standards; (2) average airborne DU-contaminant levels were *slightly* in excess of MPC; (3) whole body and lung dosage radiation exposure levels were *within* Federal standards; and (4) urine sample results were frequently above DARCOM action levels, but the Respondent's relocation policies and the short employment tenure of the average TNS employee made kidney damage unlikely. There is no evidence of any significant change for the worse in DU-exposure hazards proximate to the date of the work stoppage. In fact, the TDRH internal report of the March 9–10, 1981 investigation stated that the ''inplant site is not as contaminated as noted several years ago . . . . There are many areas that need improvement and constant updating but it appears that at the present time no crisis or eminent [sic] threat to health and safety exist.''[44] Most

[41] We also find it appropriate to accord the same degree of weight to actions by NIOSH, which was requested to investigate the Respondent's plant by TDRH, except to the extent that NIOSH's actions are premised on standards which TDRH and NRC did not apply to the Respondent's operations. In this regard, we do not accord substantial weight to findings and recommendations by NIOSH which are based on urine bioassay standards set forth in proposed Regulatory Guide 8.22. In congressional testimony, NRC Official Kerr expressly rejected the view that this uranium mill guideline, which was in any event nonmandatory, was applicable to TNS plant operations. Gore Report at 246.

[42] As indicated below, however, we allow for the possibility that it might be shown in a given case either that conditions had been concealed from the monitoring agencies or that there had been a significant abdication of regulatory responsibilities. And, of course, as also indicated above, if there is a showing that the employees had an objective reasonable basis for believing that their cumulative exposure levels were close to exceeding a known danger threshold, then the requirements of Sec. 502 would be met without regard to the monitoring agencies' failure to act.

[43] As we have noted, TDRH did not request the Respondent's exposure records during its March 1981 inspection, and there is no basis for concluding that the Respondent would have declined to produce the records if asked.

[44] Thus, although Member Devaney is correct in noting that there had been some increase in exposure to radiation at the TNS plant (at least prior to the use of respirators), there is no record evidence indicating that exposure levels had become dangerous. Whole body exposures, though somewhat elevated, never approached 5.0 rems per year, and, as the RMC report suggests, urine bioassays began to decrease after the respirator program was implemented in January

significantly, there is no evidence that either TDRH or the NRC ever considered exercising their authority to seek suspension or revocation of the Respondent's operating license, effectively shutting down the TNS plant, to protect employees from these hazards.

The judge has indicated her view that TDRH's regulation of the Respondent's operations is entitled to less weight in determining the existence of abnormally dangerous working conditions because relevant regulations were too lenient, TDRH lacked effective enforcement authority, and its findings and recommendations reflected a failure to seek independent verification of the Respondent's exposure data and representations about its safety program. We disagree. There may well be an occasion when a regulatory agency's review of safety conditions is so patently inadequate to identify hazards requiring removal of employees from the workplace that the Board should give little or no weight to agency action in assessing the objective evidence available to support a reasonable belief that conditions are abnormally dangerous. Clearly, however, this is not such a case.

The massive amount of conflicting scientific evidence and opinion in the record demonstrates that there is a considerable debate about safety standards (and the imposition of tort liability) in the nuclear industry. This does not prove, however, that the governing regulatory process is so clearly unreliable that the Board should not rely on it as an objective factor in deciding whether employees reasonably believed abnormally dangerous conditions existed at the TNS plant. Furthermore, in specific reference to TDRH's execution of its responsibilities, we note that NRC officials accompanied TDRH officials during both the November 1980 and October–December 1981 inspections of the TNS plant. In testimony at the Congressional hearing on December 8, 1981, NRC Office of State Programs Director Kerr said ''[W]e believe that Tennessee is carrying out its regulatory responsibilities in the TNS case in an appropriate manner.''

We recognize that TNS production employees were not privy to most of the voluminous scientific data, opinion, and analyses in the record of this proceeding relating to DU-exposure hazards in their workplace and may have lacked the educational skills necessary to gain full comprehension of the specific meaning of such information on their own. It is clear, however, that TNS employees had a fundamental appreciation of the potential risks of working with uranium products. In addition, they daily confronted working conditions which required no special expertise to interpret: visible DU-dust, inadequate ventilating and shielding equipment, furnace blowouts, and unsanitary changing rooms. If in the months or weeks before the strike they believed that these, or unseen hazards, might pose abnormal dangers, the employees, acting individually or through their Union could have brought this evidence to the attention of either TDRH or the TOSHA (the state agency enforcing occupational safety and health standards) or both. They did neither until they had voted on the strike and were on the verge of walking out.

Based on the foregoing analysis, we find that the General Counsel has also failed to satisfy the alternative test for Section 502 coverage, namely that working conditions at TNS were such that the cumulative effects of exposure to radioactive or other toxic substances had reached the point at which any further exposure would pose an unacceptable risk in this industry of future injury to employees.

d. *Response to the dissenting position*

Member Devaney, in dissent, finds that the employees reasonably believed that conditions in the TNS plant were abnormally dangerous. When one gets past the hyperbole in Member Devaney's dissent, it is clear that his disagreement with us boils down to his finding that when the employees walked out on May 1, they did so in response to conditions that were ''abnormally dangerous'' within the meaning of Section 502. We believe that our view of the evidence is in accord with the intent of Congress embodied in Section 502. For the reasons that follow, we reject Member Devaney's conclusion and underlying analysis.

Member Devaney cites no specific fact from which the employees could have formed a reasonable belief that conditions in the plant had worsened significantly around the time of the May 1 walkout. He nonetheless dismisses the absence of any showing of changed conditions around that time because, in his view, the conditions at the TNS plant before that date were ''already unacceptable''—presumably meaning ''already abnormally dangerous.'' He bases that finding on the fact that conditions at TNS were far below those prevailing in the nuclear industry generally, resulting in excessive exposure to DU, and on the Respondent's failure to make a sufficient effort to remove the threat to the employees' safety. Member Devaney thus finds *Anaconda*

1981. Although TNS was faulted by the authorities for relying on such measures as respirators and employee relocation rather than moving more quickly to reduction of contaminants through engineering controls (the record indicates that the equipment for engineering controls was on order and due to arrive in August 1981), there was no evidence that these measures placed the employees at unreasonable risk. In this regard, it is noteworthy that the NRC ''Standards for Protection Against Radiation'' permit the use of ''precautionary procedures, such as increased surveillance, limitation of working times, or provision of respiratory equipment'' when ''it is impracticable to apply process or other engineering controls to limit concentrations of radioactive material in air below [allowable levels].'' 10 CFR § 20.103(b)(2). This would suggest that using such measures when process and engineering controls are not ''impracticable'' is a violation of regulations but not one that the NRC would regard as producing unacceptably dangerous working conditions.

Aluminum inapplicable to this case, reasoning that, if ''already unacceptable'' working conditions exist, they do not have to become worse in order for a walkout caused by those conditions to merit the protection of Section 502. He finds that our adherence to the *Anaconda Aluminum* standard amounts to a requirement that employees ''assume the risks of the workplace—even those caused by employer neglect.''

Our colleague's analysis is wide of the mark. To be sure, if working conditions are already abnormally dangerous, no one would seriously contend that they would have to deteriorate further in order to trigger the applicability of Section 502. To that extent, we are in perfect agreement with Member Devaney. We cannot agree, however, with his conclusion that, simply because conditions at TNS were worse than for the industry generally, leading to elevated exposure levels, and the Respondent had not taken all available measures to improve matters, it follows ineluctably that those conditions were abnormally dangerous. The test is not whether the Respondent might have taken measures that would have brought conditions in the TNS plant into conformity with the industrial norm. The test is whether the conditions that did exist were such that, in the language of *Gateway Coal*, the employees reasonably believed, on the basis of objective evidence, that if they continued working they faced ''immediate danger''—an ''identifiable, presently existing threat'' to their health or safety requiring them to quit the premises.[45] Our colleague's analysis overlooks the requirement (with which he does not seem to disagree) that the conditions in question entail a degree of danger giving rise to an immediate need for employees to leave the workplace for their own protection. We fully agree with Member Devaney that an employer's failure to take reasonable safety measures in order to achieve industrial safety norms may be evidence supporting a finding that abnormally dangerous conditions exist. We merely hold that such a failure does not, ipso facto, compel that finding.[46]

We categorically reject our colleague's suggestion that the standard we apply here amounts to requiring employees to assume the risks of the workplace, even if those risks are the product of the Respondent's negligence. As we have stated, conditions that are already abnormally dangerous need not worsen in order for Section 502 to apply. Thus, employees who initially encounter abnormally dangerous working conditions are privileged under Section 502 to leave the workplace, in the same manner as employees whose working conditions are initially ''acceptable'' but later change significantly for the worse. Neither group must ''accept the risks'' of an abnormally dangerous workplace. In the former case, however, we would expect that employees would detect the presence of abnormally dangerous conditions within a reasonable time after they begin work, and would walk out at that point. Just what constitutes a ''reasonable time'' would depend on the circumstances: in some workplaces, the problem might be detected in hours (or minutes), while in others the risk posed might not become evident for days or even weeks. In this case, however, the TNS employees waited *months* before walking out, even though their working conditions had not materially changed. In attempting to explain how those employees could have had, for months prior to the walkout, a good-faith belief that the conditions in the TNS plant posed an abnormal and immediate threat to their very lives, and yet failed to strike until May 1, Member Devaney contends that they needed the jobs. That contention is only our colleague's unsupported surmise, and, in any, event, it fails to explain why the employees walked off those jobs, which they presumably still needed, *on* May 1. Although they were not required to accept abnormally dangerous working conditions, the fact that they *did* work, for months on end, under the same conditions they initially encountered, supports our conclusion that the objective evidence was inadequate to support a good-faith belief that those conditions were abnormally dangerous.[47]

Our dissenting colleague interprets our position as a finding that the employees acted unreasonably in attempting to persuade the Respondent to correct conditions at the plant before they walked out. Nothing could be further from the truth. Such attempts were not only reasonable, but affirmatively protected concerted activity. Our point is that, when the issue is whether employees reasonably believe that their working conditions threaten their lives and health, the longer they remain in the plant, working under those same conditions, the more difficult it is to find the existence of such a belief. Thus, it is not the employees' attempts to have conditions at TNS changed, but their failure, for months on end, to remove themselves from exposure to the existing conditions, that contributes to our finding that they did not reasonably believe they were in peril.

Our colleague also rejects the alternative means we have approved for establishing the existence of abnor-

[45] Thus, the issue before us is not whether there was uranium dust in the air or greensalt on the floor. The issue is whether those and other conditions that existed, in the context of the steps the Respondent did take to reduce the employees' levels of exposure to DU (such as requiring the use of respirators), reasonably would have led the employees to believe that the workplace was ''abnormally dangerous'' within the meaning of Sec. 502.

[46] Cf. *Fruin-Colnon Construction Co.*, supra, 139 NLRB at 903 (''The issue herein is, of course, not whether Respondent was 'safety conscious,' or even whether it took every reasonable or necessary safety precaution, but rather whether working conditions in the shaft were abnormally dangerous when the men refused to work therein.'')

[47] Our colleague's reliance on a 1978 TDRH report to support the applicability of Sec. 502 to a *1981* work stoppage is wholly misplaced.

mally dangerous conditions—i.e., demonstrating that employees reasonably believed, on the basis of objective evidence, that their cumulative exposure to DU had reached a level at which further exposure posed an unacceptable risk of harm. He argues that, because the effects of exposure to radioactive and toxic substances builds gradually and (for a time) asymptomatically, and because even experts differ in their assessments of the risks of such exposure, it is unrealistic, impractical, and unfair to require such a showing.

We do not dispute the facts on which our colleague relies, but we think his argument proves too much. Contrary to his suggestion, the test we announce today does not require employees to identify the precise moment at which their cumulative exposure reaches the immediate danger threshold. (Indeed, because the test requires neither a showing of injury in fact nor even of danger in fact, it does not require that threshold to have been reached at all.) However, employees who walk off the job because they think their cumulative exposure levels have reached the immediate danger point presumably do so on the basis of *some* factual predicate. We doubt that reasonable people would conclude that their lives or health were in imminent danger without *some* factual basis for that conclusion. Our test requires no more than a showing that a reasonable person, in possession of the relevant objective information, would have concluded that further exposure was unnecessarily risky. Contrary to our colleague, we do not believe that this burden is unrealistically heavy.[48]

Member Devaney also portrays our analysis as unrealistically requiring employees to walk out at the precise moment when abnormally dangerous conditions are identified—no sooner and no later. Thus, he ''reject[s our] interpretation of immediate [as used in *Gateway Coal*] as meaning only *now—not tomorrow but now*.'' This straw-man argument is completely misplaced. Nothing in our decision can reasonably be construed as imposing such a requirement. As we have said, what constitutes a reasonable time for employees to leave the workplace depends on the circumstances. When the issue is the cumulative level of exposure to substances such as DU, it may not be clear to anyone just when the abnormal danger threshold has been reached, and employees therefore should be afforded a certain amount of leeway in forming the belief that they face abnormal danger and even in making the decision to walk out. Member Devaney thus is correct in suggesting that a day or a week would not have made any difference here. But what is at issue here is not a day or a week, or even a month. As we have found, the General Counsel has not shown that the TNS employees *ever* reasonably formed a belief that their cumulative exposures had reached the abnormal danger threshold, much less that they left the premises in reasonably short order upon forming any such belief. To the contrary, the Union announced on March l0 that the employees would walk out over safety issues on May 1—*7 weeks later*—and that is just what they did. It simply defies credulity to suggest that the employees could have believed on March l0 that their lives already were in imminent and abnormal danger because of their cumulative exposure to DU, and yet continued to work under the same conditions, further elevating their exposure levels, for nearly another 2 months. In these circumstances, our colleague's ''not tomorrow but now'' argument is simply a rhetorical flourish that is without significance for purposes of deciding this case.

Member Devaney also contends that there is, in any event, enough objective evidence—including, especially, the opinions of experts in the field of nuclear health and safety—of abnormally dangerous conditions to satisfy the requirements of Section 502, despite the findings to the contrary made by the responsible regulatory agencies. We cannot agree. We believe that the findings of NRC and TDRH are significant not only as to whether abnormally dangerous conditions actually existed, but also as to whether the employees' belief was reasonable, even if based on objective evidence. In particular, the decisions of these regulatory agencies, made after numerous inspections of the TNS facility, to allow that facility to continue operating, militate against a finding that the employees *reasonably* believed that the conditions leading to the walkout were *abnormally* dangerous.[49]

Member Devaney downplays the relevance of the findings of TDRH and NRC, the two agencies with scientific and technical expertise relevant to the issues before us. Ironically, he invokes the Board's ''expertise'' while noting that ''experts disagree on radiation's effects, tolerable levels of exposure, when injury begins, and nearly every other aspect of occupational safety and public health in this area.'' In our view, the Board has no place among the experts on these subjects. In this regard, we agree with our colleague that whether the TNS employees reasonably believed that their working conditions were abnormally dangerous is a labor law question, but we disagree

[48] Member Devaney observes that different individuals have differing risk thresholds and that each employee's length of exposure would depend on his or her hiring date. Accordingly, Member Devaney argues that we are placing an impossibly heavy burden on the General Counsel, i.e., to provide a ''magic number'' applicable to all employees. Our colleague misperceives the nature of the General Counsel's problem in this case, which is his failure to identify *any* cumulative abnormal danger threshold, or to show that the employees reasonably believed that any of them had exceeded it at the time of the walkout.

[49] In this regard, we reiterate the specific finding of TDRH, made less than two months before the strike, that ''it appears that at the present time no crisis or [imminent] threat to health and safety exist.''

with his contention that it is not also an epidemiological one. In this case, the epidemiological issues are inextricably intertwined with the labor law question, because they form the basis of the employees' beliefs concerning the dangers in their workplace. The employees walked out, the General Counsel contends, because they believed that they were in danger of becoming ill or dying from cancer and/or environmental poisoning. The reasonableness of that belief is an epidemiological question if anything is.

In making the expert judgment required by the statute—whether, when the strike began, there was objective evidence that would lead a reasonable employee to regard conditions as abnormally dangerous—the Board thus properly looks to the assessments of the experts with authority under the federal regulatory scheme to monitor plants and shut down any operations within them that are unreasonably dangerous. Reasonable employees and their unions cannot ignore those experts' views. Indeed, TDRH's refusal to order the closing of the TNS plant was an objective known fact—as Member Devaney puts it, part of ''what the employees themselves had to work with''—that reasonable employees would have factored into their decision concerning whether or not to strike. As we have noted, however, the Union did not seek the views of TDRH until after a strike deadline had been set, and at no time did it receive any information from TDRH that would have supported its view that conditions had reached an ''abnormally dangerous'' level by midnight on April 30, when the contract expired and the employees walked out.

Member Devaney further asserts that our reliance on the actions of NRC and TDRH is misplaced because employee safety is not the chief priority of those agencies. That argument is unpersuasive.

First, despite Member Devaney's protestations, it is plain that employee health and safety are important concerns of NRC and TDRH. The congressional findings underlying the Atomic Energy Act state that regulation of nuclear materials and facilities is necessary for the common defense and security *and to protect the health and safety of the public*, 42 U.S.C. § 2012 (d, e). The statute authorizes the NRC to establish standards for the possession and use of nuclear materials to promote the common defense and security *or to protect health or to minimize danger to life or property*, 42 U.S.C. § 2201(b). Under that authority, the NRC has issued elaborate regulations designed to control the possession, transfer, and use of nuclear materials so that no individual's exposure to radiation will exceed NRC standards. 10 CFR § 20.1(b), 20.101–.105. TDRH has established similar regulations for the same purposes. See Chapter 1200–2–5 of the Division's regulations (G.C. Exh. 11). As the judge noted, the purpose of the Tennessee Radiological Health Service Act was to apply ''controls and regulations to radiological safety to protect the health and well being of people in Tennessee.''[50] Our colleague points to nothing in either the Federal or state regulatory scheme that suggests that NRC or TDRH would fail to seek closure of an abnormally dangerous nuclear facility because of any countervailing considerations. Indeed, he declines to guess at even what such competing considerations might be. Thus, his insinuation that employee safety and health are peripheral concerns of the regulatory agencies is simply not borne out by the record.

Second, Member Devaney overlooks the fact that we are not invoking the actions of NRC and TDRH as binding rules of law, but as factors the employees should have considered in assessing the risks of remaining on the job. In our view, reasonable employees should have given significant weight to the fact that TDRH never sought to close the TNS plant. They apparently did not.

We also reject the dissent's suggestion that, absent a showing that the agencies *would* have sought closure of excessively hazardous plants under certain conditions, the agencies' failure to close the TNS plant should carry no weight. In our view, when an agency is charged with protecting worker health and safety, and is garbed with the authority to seek closure of abnormally dangerous plants, the proper course is to presume that the agency *would* exert that authority if it found, on the basis of its own scientific and technical expertise, that conditions in the plant were, in fact, abnormally dangerous. That presumption could, of course, be rebutted by showing, for example, that the agency did not intend to seek closure, or that it had a record of chronic inaction or dereliction regarding health or safety matters. No showing of either sort has been made here.

Finally, it is irrelevant that we do not know with certainty the circumstances, if any, under which TDRH

[50] Although the statutes refer only to the ''public'' health, and do not specifically mention *employee* health and safety, employees surely are members of ''the public.'' If Congress and the Tennessee legislature, in enacting legislation designed to regulate nuclear plants in the interest of protecting public health and safety, had been unconcerned with the health and safety of employees, we presume they would not have used a term like ''the public,'' which otherwise would include employees, without emphasizing the exclusion. It is plain, however, that no such exclusion was intended. As the NRC's Kerr testified, when Congress enacted the Atomic Energy Act, it ''determined these activities should be regulated under a system of licensing to protect the health and safety of *radiation workers* and the public. The [NRC] is now charged by Congress with this responsibility.'' Gore Committee Report at 242 (emphasis added). The statutes' focus on *employee* health and safety is found in the regulations' repeated references to ''occupational doses.'' One of the meanings of that term is ''in the course of employment in which the individual's duties involve exposure to radiation.'' 10 CFR §§ 20.3(10), 20.101, 20.102; 1200–2–3–.04 (1)(u), 1200–2–5–.03 (2)(c), –.04. (''Individual'' is defined, by the way, as ''any human being.'' 10 CFR § 20.3(7); 1200–2–4–.04 (1)(q).)

actually would have sought to close the TNS plant. What is relevant is what the employees knew at the time of the walkout. Among the objective facts known to the TNS employees were that TDRH (to which the Union telegraphed on April 29, expressing concern for the employees' health) was the state agency charged with protecting the health of employees in the nuclear industry, and that TDRH had not acted to shut down the plant for any reason. For unexplained reasons, the employees apparently did not seriously consider those salient facts. There is no record evidence that the employees ignored the actions of TDRH because of any belief, objectively supported or otherwise, that that agency was not looking out for their health and safety, and would not have attempted to require their removal from a plant that it considered excessively hazardous. For the purposes of this case, then, whether or not TDRH would have tried to close the plant is irrelevant, because the employees evidently never considered that possibility in making their decision to strike.

In our view, while the objective evidence as a whole would render reasonable a belief that health and safety problems existed at the Respondent's plant, as they often do in cases involving ordinary Section 7 health and safety strikes, it would not render reasonable a belief that the conditions at the plant on May 1 were or had become so egregious as to meet the much more rigorous objective standard of abnormal danger within the meaning of Section 502.

The fact that the opinions of certain industrial health and safety experts (which were not, in any event, a basis for the employees' decision to strike) differed from the views of TDRH does not, as our colleague would have it, mandate a different result. Two things, at least, are clear from the record in this case: the nuclear industry is inherently more dangerous than most other industries, and experts can and do differ over what constitutes unacceptably hazardous conditions in the nuclear industry. In those circumstances, it is difficult to say with certainty that there is any nuclear facility that would not be pronounced unacceptably risky by some expert. Thus, under our colleague's view, virtually any work stoppage over safety conditions in the nuclear industry could be protected under Section 502. We are not convinced that such an expansive reading of Section 502 accurately reflects congressional intent.

Member Devaney asserts that, in relying on the findings of TDRH and NRC, we are contradicting *Roadway Express*, 2l7 NLRB 278 (l975). In *Roadway Express*, the Board found that a truckdriver reasonably believed that one of his employer's trucks was abnormally dangerous, even though a Department of Transportation investigator had found it safe to drive. Member Devaney views *Roadway Express* as binding precedent which requires a finding that Section 502 applies to the strike at TNS. We disagree.

Roadway Express is distinguishable from this case. The Government investigator in *Roadway* made only a visual inspection of the suspect truck; he did not drive it himself, but instead asked one of the employer's other drivers to drive it and give his opinion of the risk involved in operating the vehicle. Thus, far from bringing any agency expertise to bear on the safety question, the inspector in effect invoked the *employee's* expertise. That was not an unreasonable decision, since the danger complained of involved a jerking, twisting motion that assertedly made it difficult to hold the truck on the road, and that would be evident to one who had operated the truck and others like it. But because the investigator apparently knew nothing more about the hazards associated with driving the truck than he had been told by the second driver, there was no reason for the first driver's opinion of the truck's roadworthiness to be altered or even informed by the actions of the investigator.[51]

The contrast with this case could hardly be more pronounced. Unlike the drivers in *Roadway Express*, the TNS employees possessed no expertise whatever regarding the dangers that concerned them. Unlike a truck that can scarcely be kept on the road, ionizing radiation presents hazards that cannot be assessed or even detected by persons without technical knowledge and measurement capabilities. Thus, unlike the truckdriver in *Roadway Express*, the TNS employees depended on the expertise of others in assessing the risk of remaining on the job. In looking to the judgments of the expert agencies in this case, therefore, we are not ignoring the lessons of *Roadway Express*; we are simply recognizing the qualitative differences between the regulatory judgments called for in the two cases.

In sum, the General Counsel has failed to prove by objective evidence that the May 1 strike occurred because the employees reasonably believed at that time that working conditions were abnormally dangerous within the meaning of Section 502. Consequently, that work stoppage was an ordinary economic strike. In accord with *Mackay Radio & Telegraph Co.*, 304 U.S.

[51] Member Devaney misperceives the point of distinction between *Roadway Express* and this case. It was not that the Board particularly valued the employee's instincts and expertise that prompted the Board to reject the Government inspector's expertise in *Roadway*. Rather, it was that the Government inspector did not bring to bear his own expertise, but relied wholly on that of a second employee, that enabled the Board to give little if any weight to the inspector's determination not to pull the truck off the road. Indeed, as the administrative law judge found in the previous case (*Roadway Express*, 203 NLRB 157, 159 (1973), remanded on other grounds sub nom. *Banyard v. NLRB*, 505 F.2d 342 (D.C. Cir. 1974)), the inspector inspected the truck visually and found nothing wrong with it, but refused to drive it because he was not a truckdriver; he asked a driver to drive it and to tell him what, if anything, was wrong. That fact pattern is entirely absent in this case; TDRH made the inspections itself and exercised its own expertise—not someone else's—in not closing the plant.

333, 345–346 (1938), the Respondent lawfully hired permanent replacements for all economic strikers. It therefore did not violate Section 8(a)(3) and (1) when it subsequently refused to reinstate replace strikers to positions held by replacements on receipt of the strikers' unconditional offer to return to work.

II. ELIMINATION OF THE PENETRATOR SHOP

As previously discussed, the Respondent resumed production in August 1981, during the continuing unit employee walkout, by hiring permanent replacements. The penetrator shop, which employed approximately 20 of the original 100 employee work force, did not reopen at this time. It remained closed even after the striking employees' unconditional offer to return to work on February 15, 1982. The judge found that the Respondent violated the Act by failing to reopen the penetrator shop and to reinstate former strikers to vacancies there at the conclusion of the walkout. We disagree.

NLRB v. Fleetwood Trailer Co., 389 U.S. 375 (1967), and *Laidlaw Corp.*, 171 NLRB 1366 (1968), govern the reinstatement rights of the penetrator shop employees whose positions have remained vacant since the onset of the work stoppage. As to these employees, an employer does not violate the Act if he ''sustains his burden of proof that the failure to offer full reinstatement was for legitimate and substantial business reasons.'' *Laidlaw*, supra, 171 NLRB at 1370. By way of example, *Fleetwood Trailer* noted that the burden of proof can be met by showing that jobs were eliminated for reasons unrelated to a labor dispute such as ''the need to adapt to changes in business conditions or to improve efficiency.'' The Respondent asserts that it has met its burden of proof that the penetrator shop was not reopened for legitimate business reasons.

Prior to 1980, the Respondent's main operations were carried out in the foundry, where it produced and sold 400 and 1200-pound uranium ''derbies,'' so named for their rounded, hat-like appearance. In 1980, the Respondent initiated a new production process whereby the large derbies were converted into ''billets.'' The billets were shipped to an outside facility for extrusion into rods, which were returned to the TNS plant's newly opened penetrator shop. There the rods were transformed into the ''GAU–8–penetrator,'' an armor piercing antitank missile sold exclusively to the U.S. Air Force.

When the work stoppage commenced on May 1, the Respondent shut down the entire plant. However, production of the GAU–8 penetrator continued at Aerojet General Corporation, the Respondent's parent facility in Compton, California. Nevertheless, according to uncontradicted testimony of George Kriska, vice president of Industrial Relations at Aerojet and the Respondent's chief negotiator, within 3 months of the shutdown the Air Force began ''showing more and more concern about the fact that we were potentially going out of material . . . that affected the rest of the Ordinance Company, production of the GAU-8 round of ammunition.'' Specifically, Kriska was referring to the uranium billet production ''coming out of our TNS operation.'' Therefore, the Union was told on July 6 that the plant would reopen with replacement workers if the employees refused to return. However, counsel for Aerojet, Elwood Moger, made clear at a July 16 bargaining session that, ''due to business reasons,'' penetrator production would not resume when the plant reopened. Kriska added, ''we don't know when we will need requirements for additional penetrator production. Whether in the future it will be required we don't know.'' Accordingly, only the foundry's billet production was resumed when the Respondent reopened in August.[52]

By not elaborating at the July 16 meeting or thereafter as to the nature of the business reasons prompting the curtailment of penetrator shop production, the judge concluded that the Respondent failed to satisfy its obligation under *Fleetwood Trailer* of justifying its refusal to reinstate the employees. Further, the judge found the business reasons for closing the penetrator shop inexplicable in light of the assertion that the alleged necessity to reopen the plant was to meet its contractual obligation of supplying penetrators to the Air Force.

We note initially that an employer's obligation of proving a business defense under *Fleetwood Trailer* is not triggered until the employees unconditionally offer to return to work. Here, that was February 15, 1982, 7 months after the July bargaining session where the Respondent gratuitously proffered what the judge described as a ''bald'' business reason for elimination of penetrator production. Thereafter, in its first opportunity to do so, we find that the Respondent afforded an entirely satisfactory explanation for the unavailability of penetrator work.

During a mediated bargaining session held on March 4, 1982, the Union proposed resumption of penetrator work but the Respondent replied that it was not legally required to do so and reminded the Union that such work never took place during the work stoppage. The reasons, as explained by the Respondent's spokesman, Bill Earnest, were because since its inception in early 1980:

> The penetrator shop has not been a good operation. . . . It was an inefficient operation . . . [and] we [were] making an awful lot of defective penetrators. Reworked or scrapped. . . . Our

[52] There is no record evidence to support the judge's finding at fn. 171 that the Respondent gave as a reason for cessation of the penetrator shop that there was no need for further production of the GAU–8 missile.

> quality is subacceptable. We are using way too much material. We are spending way too many man hours to produce the penetrators.

Further details of production inefficiencies in the penetrator shop were given by two of the Respondent's witnesses at trial. Plant engineer, Joe Romaine, stated, without contradiction, that the scrap rate was ''considerably higher than the three and a half four percent level that was consistently achieved at the sister plant in California. I know . . . that it reached as high as 38 percent in there a couple of weeks. Now that is a horrendous number.'' Production Manager, Jerome Hoynacki, explained that the penetrator shop ''was designed to produce about 15,000 pieces per day, and similar to the shop in Compton, California . . . but it never came to that rate.'' Documentary evidence, in the form of a health inspection report conducted by TDRH during the spring and summer of 1980 notes that, since the date of Department's previous inspection, ''work in the Penetrator Bldg . . . has gotten underway: aiming for 5,000 penetrators/day; however, presently producing only 1800–2000/day (low production d/t problems w/feed machine difficulties).''

Based on the foregoing, we conclude that the Respondent has sustained its burden of proving a substantial business justification for its failure to reactivate the penetrator shop and recall those employees. In so concluding we reject the judge's finding that the Respondent's discriminatory motive is shown through solicitation for advice made by its representative at the March 1982 bargaining session as to whether penetrator production should recommence. This does not detract from the business defense which has been successfully established. The Respondent's purpose at this bargaining session was to seek the Union's input on how production inefficiencies, which plagued the penetrator shop since before the walkout, might be resolved. However, the Union adamantly refused to offer suggestions unless the penetrator shop was reopened. Unable to obtain and then assess the merit of the Union's advice, we think it was quite reasonable for the Respondent not to reopen. Nor do we find unlawful motive based on the Respondent's claim that it was necessary to resume operations to meet its contractual commitment of supplying penetrators—a claim that seemed ''inexplicable'' to the judge in light of the fact that the Respondent was attempting to meet that commitment without opening the penetrator shop. To meet its contractual commitment, however, all that was necessary was for the Respondent to reopen its foundry and manufacture billets (for later conversion into penetrators at the Compton penetrator shop). By resuming foundry operations in August 1981, the Respondent fulfilled its contractual requirement.

Having found that the Respondent's decision not to reopen the penetrator shop was grounded on legitimate business reasons, the failure to reinstate these employees was not a violation of Section 8(a)(3). See *Lincoln Mills Nursing Home*, 257 NLRB 1145, 1156–1157 (1981); *Bushnell's Kitchens*, 222 NLRB 110, 117–118 (1976). Accordingly, we dismiss this aspect of the complaint.

III. THE INDEPENDENT 8(A)(1) ALLEGATION

In September 1983, according to the testimony of Gary Reed, one of several employees who had been recalled to work, an official of the Respondent told a group of replacement and recalled employees that all returning ''strikers'' would retain their original seniority. This statement was apparently meant to correct an announcement made earlier that year to replacements that reinstated strikers would not retain their seniority. In January 1984, the Respondent repeated to employees that, contrary to earlier indications, it was required as a matter of law to recognize the original seniority of any returning striker.

The judge found that the ''Respondent's efforts to cure these earlier mistakes may have succeeded in giving replacements correct information concerning their seniority, but they also were likely to breed insecurity and resentment toward those whose return would undermine the higher rank they thought they enjoyed.'' Concluding that the remarks ''would naturally tend to fan the replacements' hostility against the reinstated strikers and the Union,'' the judge found that the statements violated Section 8(a)(1). We reverse.

The violation alleged by the General Counsel was not the curative remark relied on by the judge, but rather the initial erroneous statement that replacements would have seniority superior to that of reinstated strikers. There are no exceptions to the judge's failure to find this statement unlawful. With respect to the corrective statements later made by the Respondent, even assuming that replacements would react with antipathy towards coworkers whose greater seniority had not been affected by their protected work stoppage, there is no basis for holding that an accurate statement about the legally mandated preservation of seniority rights violated Section 8(a)(1).

IV. THE REFUSAL TO BARGAIN

On May 4, 1982, the Respondent withdrew recognition from the Union. It based this action on an alleged good-faith doubt of the Union's continuing majority status after receiving a decertification petition signed by 70 of 73 current employees. The judge found that this petition was tainted by the Respondent's unfair labor practices and was therefore an invalid basis for the Respondent's withdrawal of recognition. In footnote 232 of the judge's decision, she stated, ''Were it not for Respondent's unfair labor practices, I would find that the employees' petition provided a sufficient

basis for a good faith doubt of the Union's majority status.'' In the preceding sections of this decision, we have reversed the judge's unfair labor practice findings with respect to conduct preceding the Respondent's receipt of the decertification petition. In the absence either of any alternative theory advanced in support of the 8(a)(5) refusal-to-bargain allegation or of exceptions to the judge's alternative good-faith doubt finding in footnote 232, we find that the Respondent lawfully withdrew recognition from the Union.

ORDER

The complaint is dismissed.

MEMBER RAUDABAUGH, concurring.

I. INTRODUCTION

The plurality and the dissent disagree with each other on the issue of whether the employees had a reasonable belief, based on objective evidence, that the working conditions were abnormally dangerous. The plurality answers that question in the negative, and the dissent answers it affirmatively. I find it unnecessary to resolve this difficult issue. For, as explained below, even if the dissent is correct, I would nonetheless dismiss the complaint on the ground that there was no causal connection between the abnormally dangerous conditions (assumed arguendo) and the work stoppage.[1]

Although I do not reach the issue that divides my colleagues, I do wish to note my discomfort with the approach taken by the plurality. In my view, the first prong of their test fails to give adequate recognition to the fact that continued exposure to unsafe levels of radiation increases the danger to health with each passing day, even if the circumstances in the plant have not become substantially worse by the time of the work stoppage. The second prong of the test is apparently designed to deal with this problem. However, that prong has its own shortcomings. That part of the test imposes on employees the burden of showing the time at which further exposure poses an unacceptable risk. Given the scientific difficulty of the question and given the employment consequences that may be attendant to a ''wrong'' answer, I think it fundamentally unfair to impose that burden on employees.

This is not necessarily to say that I would find that the ''abnormally dangerous'' test was met in this case. Nor is it to say that I embrace all the views set forth in the relevant portion of Member Devaney's dissent. However, it is to say that, in a case where causality has been shown, I would not impose unrealistic barriers concerning the ''abnormally dangerous'' test.

II. ANALYSIS

As noted above, I conclude that the work stoppage in this case would not be within the ambit of Section 502 even if the employees reasonably believed that the conditions in the plant were abnormally dangerous.

A work stoppage falls within the ambit of Section 502 only if, in the words of that section, the employees cease labor ''because of'' abnormally dangerous working conditions. Hence, there must be a causal connection between the abnormally dangerous conditions and the work stoppage. Further, the Supreme Court has said that the working conditions must be the sole cause of the work stoppage. In this regard, the Court said that ''a work stoppage called solely to protect employees from immediate danger is authorized by Section 502.'' (Emphasis added.)[2] Thus, even if the employees reasonably believed that working conditions are abnormally dangerous, a work stoppage does not fall within the ambit of Section 502 if the employees are acting, at least in part, for other reasons.

There are strong policy reasons for the ''sole cause'' test. If a work stoppage is within the ambit of Section 502, it can occur in the face of a no-strike clause and it can occur without 8(d) notices, waiting periods, and opportunities for mediation. This kind of disruption should be tolerated only in limited situations, i.e., only if it is caused solely by abnormally dangerous conditions. If the union uses that work stoppage to serve some other agenda as well, the work stoppage should be subjected to the normal rules of Section 8(d) and no-strike clauses. Further, Section 502 is a ''limited exception''[3] to the general rule that a work stoppage is normally considered to be a strike. This limited exception is intended to permit employees to shield themselves from abnormal dangers without being considered to be on strike. The exception is not intended to be used as a sword with which employees accomplish other objectives.

My dissenting colleague would ignore the Supreme Court's language on the ground that it is dicta. I recognize that the language was not necessary to the holding of *Gateway Coal*. In this sense, I agree that there is no binding judicial precedent concerning the test for causality under Section 502. However, particularly on issues of first impression, I do not think it prudent to ignore the Supreme Court's clear pronouncement on that very issue, even if the pronouncement was not necessary to the disposition of the case before the Court. In addition, where, as here, there are strong policy reasons which support the Court's articulated view,

[1] This concurrence concerns sec. I of the plurality decision (the Sec. 502 issue). I agree with secs. II, III, and IV of the plurality decision regarding the dismissal of the 8(a)(1), (3), and (5) allegations discussed therein.

[2] *Gateway Coal Co. v. Mine Workers*, 414 U.S. 368, 385 (1974).

[3] *Gateway Coal*, supra at 385.

I think it all the more important to adopt and follow that view.[4]

My dissenting colleague misstates my position under the ''sole cause'' test. He asserts that I am holding that any work stoppage which occurs during contract negotiations will not be protected by the statute. As a threshold matter, I note that the issue in this case is not whether the work stoppage is protected by the statute. No one doubts that the work stoppage was protected by Section 7 of the statute. The issue is whether the work stoppage was entitled to any special protection afforded by Section 502. As to that issue as well, my colleague has misstated my position. Under my view, the mere fact that a work stoppage occurs during contract negotiations is not sufficient to remove the work stoppage from the ambit of Section 502. Concededly, during a contract hiatus period, there will often be an ongoing economic dispute between the parties, and that dispute will exist simultaneously with the abnormally dangerous conditions. In such circumstances, it may well be that the work stoppage is caused by the economic dispute and by the abnormally dangerous conditions. However, it does not follow that the employees cannot thereafter seek to avail themselves of the protection of Section 502. If the union simply informs the employer that the work stoppage will terminate on the correction of the abnormally dangerous conditions, even if the economic dispute is unresolved, that would appear to establish, at least prima facie, that the sole cause of the work stoppage is the abnormally dangerous condition. The employer can test the union's bona fides in this regard by cleaning up the abnormally dangerous conditions. If the work stoppage continues, it is obviously not caused by such conditions.[5]

Based on all of the above, I conclude that a work stoppage is within the ambit of Section 502 if it is caused solely by abnormally dangerous conditions.[6] I now apply that test to the facts of the instant case.

In the instant case, the work stoppage was not caused solely by abnormally dangerous conditions of work. Rather, it was caused, at least in part, by a desire to achieve favorable results at the bargaining table. In this regard, I note that negotiations for a new contract began on March 24, 1981. Throughout the negotiations, and at the time of the strike, the parties were far apart on various issues. Some of these issues directly concerned health and safety matters. Other issues did not. With respect to the latter, the Respondent's proposals included: (1) the proposal to extend the probationary period; (2) the proposal to extend the Respondent's right to layoff employees, without regard to seniority, to 10-day layoffs, as compared to 24-hour layoffs; (3) the proposal to be able to terminate those on medical leave for more than 6 months. These proposals were opposed by the Union and were significant bargaining issues. In addition, the parties were apart on management rights, checkoff, shift assignments, and vacation scheduling. Finally, although there was a tentative agreement on wages, the Union continued to believe, on the eve of the strike, that the Respondent's wage increase offer was ''still $2.00 low.''[7]

Concededly, both before and during this bargaining, there existed conditions which I have assumed arguendo to be abnormally dangerous. Thus, the critical question concerns the cause of the work stoppage. Was it caused (1) solely by a concern that further exposure to the conditions in the plant would pose unacceptable risks of present or future bodily harm; or (2) at least in part by a desire to achieve a satisfactory collective-bargaining agreement?

I conclude that the work stoppage was caused, at least in part, by the latter factor. In this regard, I note particularly that the work stoppage did not occur until April 30, the contract expiration date. This was the date that the employees would be free to strike with respect to all bargaining table issues. I also note that, on March 10, the Union threatened the strike of April 30. Assuming arguendo that there were abnormally

[4] My dissenting colleague asserts that I rest my argument largely on policy considerations. In fact, I rest my argument on the language of the statute (''because of''), the pronouncement of the Supreme Court (sole causation), and on policy considerations.

[5] My colleague asserts that the Union sent such a letter in this case. However, the letter was sent on March 10 and it referred to a possible future strike on April 30. The letter then set forth conditions under which that possible future strike could end. However, in this case, as in most negotiations, much can happen in a period of 6 weeks. Accordingly, I would not accept the Union's March 10 letter as a substitute for a simple and clear statement of what it would take to end the strike that actually began on April 30. Such a letter, if sent contemporaneously with the start of the work stoppage, would have constituted such a statement.

[6] I recognize that a work stoppage can be an unfair labor practice strike if only one of its causes is an unfair labor practice. See *Northern Wire Corp. v. NLRB*, 887 F.2d 1313 (7th Cir. 1989). However, there is a significant distinction between the two situations. A fundamental purpose of the NLRA is to prevent and remedy unfair labor practices. If an employer engages in serious unfair labor practices, and this unlawful conduct is a cause of a strike, it would be inconsistent with a fundamental purpose of the Act for the Board to assist the wrongdoer by permitting him to operate with permanent replacements during the strike caused, at least in part, by his own unlawful conduct. By contrast, the Board has no statutory obligation to prevent and remedy an abnormally dangerous working condition. Such a condition, however deplorable, is not within the remedial province of the Board. Hence, there is neither need nor warrant for the Board to apply the lenient test of causality applied in the unfair labor practice strike situation. As explained above, the purposes of Sec. 502 are fully served by limiting its coverage to employees who, in walking out, make clear their agreement to return once abnormally dangerous conditions are corrected.

[7] I find no support for my dissenting colleague's observation that the Union's statement was ''ironic in import.'' The Union thought that the Respondent's wage offer was designed to ''buy off'' the employees on the health and safety issues. However, the Union thought that the offer was ''still $2.00 low.'' I am not suggesting that the wage issue was a decisive one in the bargaining. I merely point out that it was another bargaining issue separating the parties.

dangerous conditions on March 10, they obviously did not cause a work stoppage on that day. Nor did conditions worsen between March 10 and April 30, such that a work stoppage on the latter date might be caused by plant conditions. Rather, the only thing that happened between March 10 and April 30 is that the parties were unable to reach an agreement by the latter date.

Based on the above, I conclude that the work stoppage was caused, at least in part, by a desire to achieve a satisfactory collective-bargaining agreement, rather than solely by a reaction to abnormally dangerous conditions in the plant. In response, the dissent makes two points: (1) the judge found that the employees voted to strike because they believed that abnormally dangerous conditions at the plant were endangering their health; (2) even if the work stoppage was aimed at achieving a collective-bargaining agreement, most of the bargaining issues in dispute related to health and safety. I now turn to each of these contentions.

With respect to the first point, the judge found that ''the overwhelming weight of the testimony establishes that the employees rejected the Respondent's final proposal and voted to strike because they believed that the working conditions at TNS were endangering their health.'' This finding was based on the credited testimony of various striking employees. I do not quarrel with the judge's credibility resolutions. However, I do not believe that the cause of a strike is to be determined solely on the basis of subjective testimony given by various striking employees long after the events in question. Rather, I believe that the objective facts, extant at the time of the work stoppage, are entitled to more weight. As discussed above, those facts show that there were substantial bargaining issues on the table at the time of the work stoppage. The union called the work stoppage to accomplish its bargaining objectives and, perhaps, to protest the alleged abnormally dangerous conditions. In these circumstances, I do not believe that the General Counsel, by reliance on subjective testimony, has established that the work stoppage was caused solely by the abnormally dangerous conditions.

With respect to my colleague's second contention, I note that he concedes, as he must, that at least some of the bargaining issues in dispute were not related at all to health and safety. Further, even the health and safety issues were not of such a character as to support a conclusion that the work stoppage was within the ambit of Section 502. In this regard, I respectfully disagree with my dissenting colleague's apparent view that if a union makes a health and safety proposal, in the context of an abnormally dangerous condition, a work stoppage in support of that proposal will necessarily be within the ambit of Section 502. Section 502 is designed to protect employees who engage in a work stoppage because of a legitimate concern that further exposure to abnormally dangerous conditions would pose unacceptable risks of bodily harm. Hence, if employees engage in a work stoppage to escape these conditions, the work stoppage is protected by Section 502. Further, if a union makes proposals designed to bring about an immediate correction of these conditions, a work stoppage in support of these proposals would still be consistent with Section 502. On the other hand, if the Union makes health and safety proposals which do not address the abnormally dangerous conditions or which would address them only in the future, a work stoppage in support of these proposals would not be within the ambit of Section 502. For, in those situations, the work stoppage can end if the proposals are accepted, even though the abnormally dangerous conditions remain.

Perhaps the best example of the above situation can be seen in the instant case with respect to the subject of respirator usage. Assuming arguendo that abnormally dangerous conditions existed and that the use of respirators was one of those conditions, the Union's proposal to end such usage, a key demand in the negotiations, would not take effect until many months later. That is, the work stoppage could end even if an abnormally dangerous condition persisted. To this extent, at the very least, the work stoppage was not aimed at the immediate abolition of abnormally dangerous conditions.

Similarly, even if the proposal regarding layoffs was related to health and safety, it was not aimed at the immediate abolition of the abnormally dangerous condition. If the Respondent acceded to the Union's bargaining position, employees would not be laid off because of toxic conditions. But this would not eliminate the toxic conditions.

I agree with my dissenting colleague that some of the Union's proposals were designed to remove the immediate danger. However, other proposals, although dealing with health and safety, were not designed for this purpose (e.g., the proposal regarding respirators). And, still other proposals did not deal with health and safety at all (e.g., vacation pay, shift assignments, and checkoff). In such circumstances, the Union can enjoy Section 502 protection by making it clear that its work stoppage is only for the first purpose stated above, i.e., removal of immediate danger. This is not to say that the Union must drop its other goals. Nor is it to say that it cannot engage in a protected work stoppage for these other goals. I simply say that such a work stoppage is protected only by the broad provisions of Section 7 and not by the narrow protections of Section 502.

In short, even though some of the Union's proposals dealt with safety and health, they were not sufficient

to place the work stoppage in support of these proposals within the ambit of Section 502. This is not to denigrate these proposals. They are mandatory subjects of bargaining and were advanced in good faith. Thus, a work stoppage in support thereof is an economic strike protected by Section 7. But it is only that.[8]

Based on all the above, I am not persuaded that the General Counsel has established that abnormally dangerous conditions were the sole cause of the work stoppage. Accordingly, I conclude that the work stoppage was not covered by Section 502.[9]

MEMBER DEVANEY, dissenting.

1. Introduction

I dissent from the dismissal of the complaint. I would find that TNS violated Section 8(a)(3) and (1) by refusing to reinstate the employees who walked out of the TNS plant at midnight on April 30, 1981.[1] Today, my colleagues post notices to employees facing dangers from slow-acting toxins or radioactive substances. The plurality, Chairman Stephens and Member Oviatt, warns: If you face exposure to toxins causing injuries that are not readily apparent, do not look to the Board; the level of proof required to invoke Section 502 puts protection beyond your reach. My concurring colleague, Member Raudabaugh, warns: If you cease work because of abnormally dangerous conditions, time your walkout carefully. If it occurs during contract negotiations, the statute will not protect you. And all of my colleagues tell employees: Even if you time your walkout properly and establish every factual showing we require, you still may risk the loss of your job through permanent replacement—the Board does not decide that issue here. Both the plurality and the concurring views impose arbitrary and unreasonable standards which deny employees the protection of the statute.

Both views pay only lip service to the principle, explicitly articulated by the plurality, that Section 502 protects employees from abnormal dangers resulting from slow-acting radioactive or toxic substances. Given the opportunity to bring the Board's expertise to bear on life and death issues, my colleagues have chosen, in both their analyses, to craft hypertechnical standards that ignore the realities of today's workplace. Both the plurality and the concurrence render the statute a nullity to employees working with radioactive or toxic substances because the dangers they face, and their efforts to deal with those dangers, do not correspond to traditional notions of workplace safety.

I emphasize that the Board is writing law on a clean slate today. Neither the plurality nor the concurring view is inherited from an earlier, less enlightened Board, mandated by legislative history, or derived from clearly articulated Board or Supreme Court rules of law. Rather, although my colleagues work hard to make their separate results appear determined by binding precedent, this is a case of first impression. In such cases, the Board should look for guidance to the intent of Congress as evidenced in the language of the statute, at binding Board and Supreme Court precedent where they exist, and at congressional intent underlying the labor laws as a whole. Such an inquiry strongly supports adopting the judge's findings that TNS violated Section 8(a)(3) by failing to reinstate the employees when they offered to return to work.

My colleagues follow different routes to a very different destination. Where the legislative history of the Taft-Hartley Act is silent with respect to Section 502, the plurality points to congressional debate over prior defeated legislation as support for its result. Where no binding Supreme Court case directly speaks to the application of the statute to the facts here, both the plurality and the concurring opinion dress up the Court's comments on mooted issues in *Gateway Coal Co. v. Mine Workers*[2] as the holding of the case and black letter law. Where Board law is silent with respect to the application of Section 502 to cases involving slow-acting toxins, my colleagues in the plurality cobble together statements from cases with clearly distinguishable facts into ''precedent.'' An examination of the

[8] *Combustion Engineering*, 224 NLRB 542 (1976), cited by my colleague, is quite consistent with my view. If the employer there removed the dangerous condition (the existence of drunk and belligerent coworkers), the work stoppage would come to an end.

My dissenting colleague says that the danger in *Combustion Engineering* was qualitatively different from that in the instant case. Assuming that this is so, I fail to see the relevance of the distinction. The significant point is that the abnormally dangerous condition in that case was the sole cause of the work stoppage. The issue is not the type of abnormally dangerous condition but rather whether that condition is the sole cause of the work stoppage.

My colleague also relies on *Knight Morley*, 116 NLRB 140 (1956). Without getting into a discussion of the several differences between that case and the instant one, suffice it to say that the case was decided before the Supreme Court articulated the ''sole cause'' test in *Gateway*. Contrary to the suggestion of my colleague, there was no reason for the Supreme Court in *Gateway* to say that *Knight Morley* was incompatible with its decision. The decision in *Knight Morley* speaks of the reason for the work stoppage, language that is wholly compatible with the ''sole cause'' test of *Gateway*.

[9] Although the Supreme Court used ''sole cause'' language, I leave open the possibility that a work stoppage could be protected by Sec. 502 if it is caused almost entirely by abnormally dangerous conditions, i.e., the other causes are de minimus. For the reasons discussed above, I do not think that the work stoppage herein meets this test.

[1] Unless otherwise noted, all subsequent dates in the months January through July are in 1981 and all dates in the months August through December are in 1980.

The judge also found that the Respondent violated Sec. 8(a)(1) by telling its work force that the employees who engaged in the work stoppage would not be reinstated with seniority rights, violated Sec. 8(a)(3) with respect to the failure to reopen the penetrater shop, and violated Sec. 8(a)(5) and (1) by refusing to bargain with the Union after October 29, 1982. I would adopt these findings.

[2] 414 U.S. 368 (1974).

plurality's ''precedent'' in context, however, exposes it as merely a vehicle for a result dictated by unstated policies which, in my view, are clearly incompatible with the underlying purposes of the Act.

Thus, Supreme Court and Board precedent provide no basis for the plurality and concurring opinion positions that the 8(a)(3) allegations must be dismissed; moreover, both positions ignore the conflicts between their respective analyses and case law. In contrast to the plurality, prior cases have not provided employers that require employees to breathe, eat, and wash in uranium dust—unnecessarily and preventably—with legalistic rules tailor-made to exclude employees from Section 502's coverage. In contrast to the concurrence, prior cases have not set a causality standard so restrictive that the mere simultaneity of a walkout with ongoing negotiations is sufficient to remove the statute's protection—particularly where the employees successfully demonstrate that their belief in abnormally dangerous conditions was based on objective evidence. And contrary to both positions dismissing the 8(a)(3) allegations, prior cases set no precedent for denying Section 502 coverage to employees reduced to cleaning improperly equipped respirators in buckets of contaminated water because they presented their employer with an opportunity to correct the overexposure to toxins they believed put them in abnormal danger. I do not believe that when Congress excepted work stoppages for abnormally dangerous conditions from the definition of strikes, it contemplated that a walkout satisfying the statute's requirements would lose protection simply because a state regulatory agency failed to act to close the facility down, or because it occurred during contract negotiations—yet my colleagues so hold today.[3]

2. Permanent replacement and Section 502

I would reach a different result, in both law and policy, on the clean slate before the Board today. With respect to the law, the appropriate judgment is to adopt the judge's finding—based on findings of fact and credibility resolutions that neither the plurality nor the concurrence disputes—that TNS violated Section 8(a)(3) and (1) by failing to reinstate the employees who engaged in a work stoppage protected by Section 502 and that it is obligated to reinstate them. With respect to labor policy, the appropriate choice is to ensure that employees' job rights are protected when they leave their jobs because they have a reasonable belief, based on ''ascertainable, objective evidence that an abnormally dangerous condition for work exists.''[4] This result and this policy choice are fully consistent with precedent and with the purposes underlying the labor laws.

The National Labor Relations Act grants employees the right to engage in a work stoppage in support of economic demands or for noneconomic reasons, e.g., in response to an employer's unfair labor practices or because of abnormally dangerous conditions in the workplace. With respect to the right of employees to strike over economic demands, Congress and the Supreme Court have balanced that right with a corresponding economic right of employers: to keep the business running by replacing striking workers.

Thus, *Mackay Radio*[5] acknowledges that an employer faced with an economic strike has a legitimate interest in operating his business during that strike. In essence, the parties are engaged in economic warfare during an economic strike, and the law currently balances their weaponry: the employees can use the strike as an economic weapon, but the employer can defend itself by continuing to operate through hiring permanent replacements.[6]

However, neither the Board nor the courts have ever applied the *Mackay* principle beyond the narrow confines of an economic struggle. For example, if employees are engaged in an unfair labor practice strike, the *Mackay* principle does not apply. When employees engage in a work stoppage caused in whole or in part by the employer's unfair labor practices, the strike is not an economic weapon; therefore, the employer cannot bring its own economic weapons to bear on the strikers by hiring permanent replacements. Moreover, since the employer's own unfair labor practices have fostered the strike, permitting the employer to permanently replace striking employees would clearly be inequitable. Thus, in contrast to the economic strike, where an employer serves its legitimate economic interests if it chooses to replace strikers, in an unfair labor practice strike the employer has no legitimate interest in perpetuating its own unlawful conduct.

For the same reasons, the employer's right to wield economic weaponry as set forth in *Mackay* should not extend to a Section 502 work stoppage. When employees quit the workplace because they believe that abnor-

[3] The plurality states that my disagreement with it boils down to our interpretation of the evidence: I conclude that the employees walked out in response to abnormally dangerous conditions; they conclude that the employees did not reasonably believe such conditions prevailed. My disagreement with the plurality goes far beyond this difference. In my view, the plurality looks at the facts here through antiquated lenses. As I discuss below, their analysis would work very well if the TNS employees had faced an emergency, such as an imminent explosion, but it simply will not work where the novel nature of the threat the employees faced differs so profoundly from those in earlier cases that a new, more flexible approach is required.

[4] *Gateway Coal Co. v. Mine Workers*, supra fn. 3, 414 U.S. 368, 387, quoting 466 F.2d 1157, 1162 (4th Cir.) (Rosenn, dissenting).

[5] *NLRB v. Mackay Radio & Telegraph Co.*, 304 U.S. 333 (1938).

[6] Legislation to overturn *Mackay Radio* was introduced in the 102d Congress and is expected to be reintroduced with the beginning of the 103d Congress in January 1993.

mally dangerous conditions prevail, they are not using the work stoppage as an economic weapon. Rather, they are forced out of the workplace by abnormally dangerous conditions. Indeed, the case for protecting such employees against permanent replacement is even stronger when the walkout is over abnormally dangerous conditions than when unfair labor practices have caused or contributed to a strike. In the former situation, the employees leave the workplace for fear of injury or death. In the latter situation, although the unfair labor practices are abhorrent to the employees and the NLRA, they do not threaten the very health of the employees.

Finally, the policies underlying Section 502 itself are best served by protecting employees engaged in a Section 502 walkout from permanent replacement. Section 502 provides that the quitting of labor by employees because of abnormally dangerous working conditions shall not be deemed a strike. Thus, although its legislative history is scanty,[7] Section 502's broad and positive language establishes one basic and profoundly significant fact: a Section 502 work stoppage is not an economic action; therefore, in contrast with an economic strike, no basis for a balancing test exists when employees walk off the job over abnormally dangerous conditions, because the express language of Section 502 states that this type of work stoppage *is not a strike*. Thus, in enacting Section 502 Congress elevated the right of employees to work free of abnormally dangerous conditions above their interests in other terms and conditions of employment. In further contrast to economic strikes, neither Congress nor the Supreme Court has created an equivalent employer right to be balanced against the right to a workplace free of abnormal dangers. Indeed, it would be folly to balance the right of employees to be free of abnormally dangerous working conditions against the right of employers to maintain abnormally dangerous workplaces, just as, in the context of an unfair labor practice strike, it would be folly to balance the right of employees under the Act to be free of employer interference, coercion, or restraint against an employer's ''interest'' in interfering with, restraining, or coercing its employees' exercise of their rights. It follows, then, as the court observed in *Clark Engineering v. Carpenters*,[8] that ''[w]hen a work stoppage properly results from abnormally dangerous working conditions, an employer cannot resort to the weapons available to him in an economically-motivated work stoppage''—including permanent replacement.

Under these principles, there can be no question that, if Section 502 is applicable, the statutory right of the TNS employees to cease work in the face of abnormally dangerous working conditions must outweigh TNS's interest in operating the plant with permanent replacements.

3. The plurality's test for abnormally dangerous conditions: Has the General Counsel demonstrated that the TNS employees had a reasonable belief, based on ascertainable, objective evidence that an abnormally dangerous condition for work exists?

I answer this question with a resounding YES! In my view, the judge correctly found that Section 502 applies to the work stoppage here. I find the plurality's opposite result inconsistent with the factual record, with case precedent, and with the realities of the workplace.

The plurality concedes that Congress intended that Section 502 apply to dangers from substances causing injuries that are hidden for decades, and that the General Counsel need not demonstrate that employees are already symptomatic to show that Section 502 protects their work stoppage. Indeed, on its face, the plurality's test for coverage under Section 502—that employees must show a reasonable belief, based on objective evidence, that remaining in the workplace would expose them to abnormally dangerous conditions[9]—is sound, and, if this test were properly applied to the facts here, I too would subscribe to it.

I part company with the plurality, however, because its analysis silently nullifies Section 502's application to dangers not directly comparable to their ''mine disaster paradigm.''[10] I disagree with the plurality's self-contradictory assumption that Congress and the Supreme Court intended Section 502 to be applicable to slow-acting toxins, *but only when* employees make the

[7] The plurality has spun a ''legislative history'' from a few remarks made in connection with a completely different earlier piece of legislation, the Case bill, which was vetoed after passage by President Truman and which differed in numerous respects from the Taft-Hartley Act. The plurality's exposition of the Case bill in fn. 26 and related text discusses its relationship to Sec. 502. The plurality's analysis there inadvertently but clearly demonstrates how little basis exists for interpreting Sec. 502 as if it were the Case bill.

Reliance on congressional comments made about other legislation, and thus plainly irrelevant to the statute at issue, is improper—and jurists have not hesitated to say so. ''Congress conveys its directions in the Statutes at Large, not in excerpts from the Congressional Record, much less in excerpts from the Congressional Record that do not clarify the text of any *pending* legislative proposal.'' *Begier v. IRS*, 496 U.S. 53, 68 (1990) (Scalia, concurring) (emphasis added).

[8] 510 F.2d 1075, 1080 (6th Cir. 1975) (citations omitted).

[9] However, I interpret the phrase ''remaining in the workplace'' differently from Chairman Stephens and Member Oviatt. They appear to believe, based on their reading of *Gateway Coal*, supra fn. 2, that the abnormal danger must force employees to flee for their very lives. As I show below, such an interpretation is inconsistent with their finding that Sec. 502 applies to dangers causing delayed injuries and reduces the complexities of industrial life to melodrama.

[10] The plurality's ''paradigm,'' which blinds it to the statute's applicability in nonemergency situations, is simply a fiction. The legislative history of the Taft-Hartley Act makes no reference whatsoever to a ''mine disaster paradigm,'' nor, for that matter, to a mine disaster, or even a mine. See fn. 7, supra.

same factual showing required of employees facing emergency dangers such as runaway rail cars or sudden bad weather: that the danger require that they abandon the workplace in haste at the moment the abnormal danger occurs.

In failing to realize that the analysis developed in earlier cases, in which employees faced threats with immediate, tangible consequences, will not transfer directly to the subtler, more insidious threat addressed here, the plurality bars employees facing such dangers from the statute's protection even as it announces that the statute applies to them. In reality, employees facing future illness or injury are situated differently than employees dealing with malfunctioning equipment, a runaway boxcar, or the like. While there is very little ambiguity about a boxcar on the loose, employees facing dangers from overexposure may not know how to interpret sometimes confusing or contradictory technical data and how best to balance their own safety against their need to make a living. They may, as did the employees at TNS, slowly realize that they are in danger, they may realize their danger despite assurances by their employer that no danger exists, as did the TNS employees, and they may try to persuade their fellows to join them in an effort to take effective action. They may fear unemployment, and the consequent inability to take care of those who depend on them, nearly as much as they fear cancer or kidney failure.

Chairman Stephens and Member Oviatt state that they cannot comprehend how the TNS employees could have had a good-faith belief that conditions in the TNS plant posed an abnormal and immediate threat to their lives for months before the workout, and still have continued to work in the plant until the May 1 work stoppage. The answer is simple. They needed the jobs.[11] The employees tried, through Bettis' ultimatum, to give their employer one last chance to remedy the abnormally dangerous conditions. It is disingenuous to assert that ''reasonable people'' would not continue to work in a plant they believed to be abnormally dangerous; therefore, if these individuals continued to work in such a plant, one must conclude, as the plurality does, that ''the objective evidence was inadequate to support a good faith belief that those conditions were abnormally dangerous.'' This oversimplification ignores the facts found by the judge as to the employees' struggle over months to decide what course to take with respect to their fears of overexposure.[12]

Further, the plurality treats the 7 weeks between Union President Bettis' March 10 ultimatum that the employees would stop work over safety on April 30 and the April 30 walkout as if the employees had waited 7 years. In my view, 7 weeks is not an unreasonable time to allow an employer to correct basic safety conditions. The plurality's exaggeration of this length of time has the effect of penalizing the TNS employees for trying to get their concerns about overexposure addressed without a walkout.[13]

---

[11] The plurality is skeptical as to the accuracy of this observation. A look at the TNS employees and their circumstances should convince anyone that the pressure of very real economic necessity made fear of job loss a paramount concern for them. None of the employees had more than a high school education; many had not gone that far in school; a few were virtually illiterate. See Tr. at 8998(a). The record shows that many employees were so afraid that they were being poisoned by the toxins at TNS that they wanted to walk out before April 30, but fear that they would lose their jobs restrained them.

My disagreement with the plurality on this point comes down to this: the plurality maintains that the TNS employees did not act like reasonable people would act if they were in an abnormally dangerous situation. I believe that the TNS employees did not act unreasonably in trying to assure that they could get the conditions they feared corrected and still hold onto their jobs. In its implicit acknowledgment that employees should not be forced to choose between a job and freedom from abnormal danger, Sec. 502 also acknowledges that employees in fact have had to make such choices; nothing in the statute forecloses the possibility that under many circumstances, employees will be forced to choose the job rather than their safety. The plurality, not Sec. 502, defines appropriate employee response to abnormal danger so narrowly and so arbitrarily that efforts to get TNS to right conditions in the plant and allowing TNS time to do so provide a basis for its conclusion that the employees did not reasonably believe that abnormal danger existed. The employees should not be penalized for trying to exhaust other avenues before walking out. Yet that is what the plurality does, by branding their so-called delay—during which efforts were made to negotiate a solution to the problems at the plant—as unreasonable.

[12] See ALJD infra at 80–86.

The Board has not always failed to view employee behavior in light of employees' need to get dangerous conditions rectified while taking as few chances with their employment as possible. In *Knight Morley Corp*., 116 NLRB 140 (1956), enfd. 251 F.2d 753 (6th Cir. 1957), cert. denied 357 U.S. 927 (1958), the Board upheld a finding that employees who walked off a job because of the malfunctioning of a ventilator were protected by Sec. 502 even though employees from other sections finished out the shift without complaint, the next shift worked with no change in conditions, and the employees who engaged in the walkout returned the next day to go to work. Under the plurality's view that ''no reasonable person'' would continue to work when conditions were abnormally dangerous, the employees who walked out in *Knight Morley* should not have been protected, as other employees, presumably reasonable people, kept on working. The Board took note of testimony that the next shift of buffers kept on working through the dirt and heat because they were afraid they would be fired. Id. at 144.

[13] The very questions the plurality raises with respect to the actions of the Union and the TNS employees indicate its failure to grasp the meaning of slowly developing dangers and how employees who face such threats grapple with the issues such dangers raise: Why did the employees not consult TDRH before walking out? Why did the employees consider striking in October–November 1980, but allow the Union to dissuade them? Why did they choose May 1 to strike when the plant was just as dangerous at other times? Such questions would be highly relevant to a situation in which employees were faced with dangers that might strike them down at any moment. See, e.g., *Philadelphia Marine Assn*., 138 NLRB 737 (1962), enfd. 330 F.2d 492 (3d Cir. 1964), cert. den. sub nom. *ILA v. NLRB*, 379 U.S. 833, 841 (1964) (employees feared being struck by falling cargo). None of these questions, however, is directly relevant to the question of whether TNS employees reasonably believed that day by day, shift by shift, their chance at living a healthy life was diminishing. Further, each of the questions the plurality finds so telling can

Nor does the plurality's claim that its test allows for circumstances where abnormally dangerous conditions are present from the time when employees begin work indicate that the test is genuinely adaptable to varying circumstances. In such a case, the plurality would allow a ''reasonable time'' for employees to quit the workplace. But employees had better act quickly, as the plurality states that ''employees would not stay long'' under such conditions. Employees should take further heed from the plurality's conclusion, in the first Board case presenting the issue of the timing of the employees' response to danger, that the 7 weeks between the union's ultimatum and the walkout (or, as the plurality phrases it emphatically elsewhere, ''*months*'') was unreasonable. This bodes ill for employees in comparable situations, as the plurality never explains by what measure the 7 weeks is too long. What is more, the plurality still does not address the situation of employees who realize over time that their exposure is excessive and are unsure how to coordinate a response.

The plurality builds its ''flee for their lives'' approach of this first alternative on three supports: first, the ''mine disaster paradigm'' it claims inspired Section 502; second, the Court's use of the terms ''immediate danger'' and ''identifiable, presently existing threat''; and third, Board precedent applying the first two. It views these foundations as mandating that employees flee their workplace now, as opposed to tomorrow or next week, to qualify under Section 502. This is a leap of logic I cannot make. As noted above, no ''mine disaster paradigm'' exists in the Taft-Hartley Act's legislative history. As Justice Douglas stated in dissent in *Gateway Coal*, ''there is nothing in its legislative history to shed light on its purpose.''[14] Further, I disagree with the plurality's interpretation of the word ''immediate.'' I think it clear that the Court meant by an immediate danger a nonspeculative presently existing one, as opposed to the type of illusory dangers that the Court majority illustrated in its example of an employee's doubt of a supervisor's competence.[15] I reject the plurality's interpretation of *immediate* as meaning only now—*not tomorrow but now*.[16]

Thus, the plurality's emphasis on the passage of time between Bettis' ultimatum and the work stoppage follows from its failure to comprehend the difference between longterm, slow-acting hazards and immediate hazards, such as those earlier cases have presented. The TNS employees' efforts over many months to get plant conditions changed works against a conclusion that they reasonably believed that they were in abnormal danger *only if* abnormal danger is limited to emergency conditions and their responses are compared to those of employees in emergency conditions. Nothing in the statute limits its reach to emergencies; however, despite their assertions to the contrary, the plurality's analysis, based on its fictitious ''mine disaster paradigm,'' is distorted by arbitrary and self-imposed boundaries not derived from Section 502 itself.

The plurality's test suffers from other flaws. As to the first prong, the plurality arbitrarily establishes prewalkout prevailing conditions at TNS as the sole standard for distinguishing ''abnormal'' from ''normal'' dangers. This false first step is based on the plurality's unsupported premise that '''abnormally dangerous' does not turn on a standard degree of deviation from a single norm of industrial safety.'' This test means, in effect, that the plurality need not address conditions as they actually were at TNS; the plurality need only compare prewalkout conditions with the usual state of affairs at the plant and find no significant decline—regardless of the real level of danger in the plant. Moreover, the plurality's reasoning presupposes that employees working in dangerous plants assume the risks of the workplace—even those caused by employer neglect. This idea has long been rejected and is incompatible with Board and judicial precedent and with the purposes of the Act.

a. *The plurality's first alternative: Have employees shown that they reasonably believed, on the basis of objective evidence, that inherently dangerous conditions changed substantially for the worse immediately before the walkout?*

Chairman Stephens and Member Oviatt find that the TNS employees failed to show that their belief that they worked under abnormally dangerous conditions had an objective basis because they cannot demonstrate that conditions at TNS became ''significantly worse'' immediately before the walkout. Notwithstanding the judge's description of the nightmarish conditions before the walkout and TNS's intransigent refusal to correct them, the plurality holds that TNS's *own practices* are the sole benchmark for determining

be answered plausibly without endangering a finding that the employees believed they were being subjected to grave dangers: a brief delay would not necessarily make a difference; TDRH had visited the facility before and no real improvement had resulted; where other economic opportunities are few, employees hesitate to walk off their jobs.

[14] 414 U.S. 368 at 391.

[15] Id. at 386.

[16] The plurality refers to my analysis of the timing issue as a ''straw man'' argument. It is anything but that. The *true* ''straw man'' in this case is the majority's fictional ''mine disaster paradigm.'' As I stated above, it is only by reference to this fictional ''legislative history'' that the TNS employees' wait to walk off for a response from their employer to their ultimatum is anything but eminently reasonable and responsible. Similarly, my criticism of their ''not tomorrow but now'' interpretation of *Gateway Coal* ''immediate danger'' is no rhetorical flourish. The plurality has chosen the narrowest possible meaning of the word ''immediate'' and applied it to facts requiring a more flexible approach.

whether the protested conditions were ''abnormally dangerous.'' Even assuming that this standard is legitimately derived from binding precedent, which it is not, it simply does not work in cases like this one, where employees will be required to demonstrate a significant decline in *already unacceptable* conditions. Thus, the plurality's first alternative sets up a perennially sliding scale for Section 502 protection when applied to employers that expose employees to unnecessary risks. In effect, the more reprehensible the employer is, the less protection the employees have. At some point conditions could no doubt get so close to the bottom that a dramatic drop from the ''normal'' is no longer possible.[17]

The plurality offers no justification for such a standard. No binding Board or judicial precedent supports its theory. The plurality cites one case, *Anaconda Aluminum Co*.,[18] to support using an employer's idiosyncratic practices as the benchmark for differentiating ''abnormal'' dangers from ''normal'' or acceptable ones, and claim to follow ''the Board's'' reasoning there.[19] In reality, the plurality cites dictum of the administrative law judge, inapplicable here because the employer in *Anaconda* had, in the judge's view, taken all reasonable steps to ensure employee safety.

In *Anaconda*, the discharged employee[20] balked at performing a hazardous routine job after its most dangerous phase had ended; the judge found that the procedure in use when the refusal occurred ''was an acceptable one when viewed from the standpoint of safety''[21] and that further safety options were available to and ignored by the dischargee. The judge concluded that ''a known but acceptable degree of danger'' existed, with no unusual danger to employees. Thus, the judge's comment in *Anaconda* that Section 502 is not activated ''merely because employee patience with prevailing conditions wears thin or their forbearance ceases'' was made in the context of ample evidence of thorough safety precautions. It provides no precedent for a case like TNS, where the employees' awareness of a hazard develops over many months and the ''prevailing conditions'' are plainly unacceptable from the point of view of safety.[22]

The plurality's refusal to weigh the evidence as to the level of danger present at TNS when the work stoppage occurred is all the more puzzling in light of the findings by virtually every regulatory or expert entity that examined the operations at TNS that conditions were dangerously substandard. The National Institute of Occupational Safety and Health (NIOSH) found, for example, that between 1978 and 1981, 32 percent of the work force had a yearly dose of radiation to the lung that represented an inadequate margin of safety for employees. TNS itself viewed the operations as unacceptably hazardous to employees. TNS Representative Richard O'Brien admitted to the House Subcommittee on Investigations and Oversight of the Committee on Science and Technology (Gore Committee) that safety conditions at TNS when negotiations were going on were ''substandard,'' that TNS management had internally admitted that ''the Union really was right, then that you [i.e., TNS] weren't really doing the job you should with respect to health and

[17] The plurality states that ''the crux'' of the judge's conclusions, and mine, is the concern that TNS did not take corrective measures ''in reaction to governmental directives and a substantial body of scientific opinion indicating a direct incremental correspondence between DU [depleted uranium] levels and the incidence of cancer or kidney damage.'' The plurality is half right: the ignored governmental directives and the scientific opinion directly linking overexposure to DU to kidney disease and cancer do constitute the ''crux'' of the judge's conclusions, and of mine as well. The plurality's only mistake is its erroneous impression that either the judge or I reach the conclusion that abnormally dangerous conditions prevailed at TNS *solely because* management there did not take the necessary measures to bring the facility up to industrial norms. A fair reading of my opinion and the judge's decision dispels this impression.

[18] 197 NLRB 336, 384 (1972).

[19] I note that *Anaconda* has been cited for the principle at issue here in only two cases, and both are distinguishable from this case. In *Baker Marine Corp*., 258 NLRB 680 (1981), an employee, upset by the death of a coworker from unrelated causes, exhorted his coworkers to refuse to climb into '''eagles' nest''' derricks, in which small fires were common and harmless, unless exits were increased. An OSHA check on that very point had found egress adequate; in addition, the employees' union begged them not to quit work. In *Custodis-Cottrell, Inc*., 283 NLRB 585, 589 (1987), the Board found that objective evidence did not support employees' subjective fear that rain and lightning increased the danger inherent in the work. The judge discredited employee testimony about the physical dangers and noted that the employer had in fact permitted employees to leave the area where the rain was falling.

[20] The judge also concluded that dischargee Nicholls was not acting in good faith, but did not rely on this finding.

[21] Id. at 344.

[22] Other Board and judicial cases are equally unavailing to the plurality. No case supports the theory that, regardless of the conditions of the workplace, the benchmark for ''normal danger'' is the immediate employer's practice. Other Board cases in which the Board has refused to find ''abnormally dangerous conditions'' are, like *Anaconda*, fully distinguishable from this case. In each case the employer, while conducting a business involving jobs dangerous by their very nature, exercised due diligence in safeguarding the health of employees. See *L. E. Meyers Co*., 270 NLRB 1010 (1984) (''dusting'' of snow on horizontal beam did not constitute abnormally dangerous condition; work always hazardous but employees were able to brush snow away and use safety belts); *NLRB v. Fruin-Colnon Construction*, 330 F.2d 885 (8th Cir. 1964) (where work inherently perilous, employer instituted measures to protect employees; employees were protected from each hazard cited by General Counsel and had worked through more severe conditions prior to walkout). These cases simply do not involve the consistent neglect of rudimentary safety precautions such as the judge found here. They do involve, and I endorse, a realistic deference to the necessities of performing dangerous work—where additional precautions would not make the work safer. See *Daniels Construction Co*., 264 NLRB 770 (1982) (task of cleaning waste pipe at nuclear plant inherently dangerous; employer provided equipment, training, and precautions to minimize hazards; no evidence that the task could be made any safer).

safety'' and that, although an ALARA program[23] had started at TNS before the walkout, the facility was not successfully following the principle at the time of the walkout.[24]

In addition, the plurality's refusal to consider the evidence that TNS's practices deviated significantly from accepted industry standards and that TNS had not taken rudimentary precautions to protect employees from unnecessary hazards has negative consequences for employers as well as employees. Under the plurality's analysis, TNS is the type of employer afforded the fullest protection: an employer that ignores basic safety precautions, uses stopgap measures when problems arise, counts on high turnover[25] to prevent toxic results, and misleads oversight agencies concerning its efforts to correct cited problems.[26] For employees, this approach also forces those who, like the workers at TNS, realize over time that their well-being is in jeopardy to wait and, paradoxically, to hope for a catastrophe to protest abnormally dangerous conditions without risking job loss.

In my view, an industrywide hazard comparison is called for in analyzing whether objective evidence supports employees' belief that conditions are abnormally dangerous. The statute's language implicitly requires a comparison of conditions prompting a walkout to ''normal'' dangers. In defining the term ''abnormally dangerous,'' I look to an early Board definition: in *Fruin-Colnon Construction Co.*,[27] the Board adopted a judge's definition of ''abnormal'' as ''deviating from the normal condition or from the norm or average.''[28] I would look at the risks *in the work itself* to determine the ''normal'' level of danger—as opposed to dangers arising from the employer's idiosyncratic practices. I would find abnormally dangerous conditions where employees are exposed to risks that, under a standard of reasonableness, constitute excessive or ''abnormal'' risks to their lives when compared to dangers inherent in the work itself, whether these heightened risks arise from a change in conditions or from a disregard for employee safety.[29]

Thus, in this case, I would take conditions prevailing in the nuclear industry as a whole as indicating ''normally dangerous conditions'' in an inherently dangerous industry, and, noting how far below standard the conditions at TNS had fallen, I would find this gap a significant factor, among others, in assessing whether employees had an objective basis for a belief that conditions were abnormally dangerous. But my inquiry would not stop there. As the ''reasonable belief'' standard requires an examination of the facts as the employees knew them, the characteristics of day-to-day operations in the TNS plant are of central importance.[30]

During the relevant period, TNS manufactured and sold, chiefly to the U.S. Air Force, ''penetrators,'' or armor-piercing, ''conventional'' projectiles. Depleted Uranium (DU), used to make the penetrators, is a very heavy, somewhat radioactive metal that entered the plant in the form of ''greensalt'' (uranium tetrafluoride). Greensalt is heated with magnesium to 3000F in huge retorts, or pots, to produce uranium ingots called ''derbies.'' In 1979 the derbies ceased to be TNS' end product, and the derbies were molded into ''billets'' by melting two 1200 lb. derbies in a huge vacuum furnace. Before the work stoppage in 1981, these billets were extruded at another plant and then returned to TNS to be cut and finished into penetrators. Before 1980, TNS also produced compounds containing thorium, a radioactive material. As the judge found, DU presented a health threat to em-

[23] ALARA stands for ''as low as reasonably achievable.'' In 1971 the Nuclear Regulatory Commission (NRC) amended its standards to require nuclear licensees to try to keep radiation exposure to that level. The ALARA standard is based on the assumption that no dose of radiation, however low, is without risk.

NRC delegated its statutory oversight authority with respect to aspects of employee safety related to radiation to the Tennessee Department of Radiological Health (TDRH) under an ''agreement state'' plan.

[24] See H.R. Rep. No. 102, 97th Congress, 1st Sess. (Gore Report), pp. 120–121.

[25] The plurality weighs this factor as a legitimate assurance of protection of employees from kidney failure. I reject this reasoning, as the entire purpose of Sec. 502 is to permit employees to retain their jobs but escape the abnormal danger.

[26] Specifically, TNS failed to report to TDRH that it had instituted a mandatory respirator program; represented to TDRH that the program was strictly temporary, when it planned to allow the ineffectually implemented program to continue for full workdays for at least 8 months; failed to disclose to TDRH that its air monitoring data had recorded excessive concentrations of contaminants in the first calendar quarter of 1981; and assured TDRH that it was correcting the problems the Division was citing when it was not. See sec. G. *TDRH Inspections*, ALJD infra at 1418.

[27] 139 NLRB 894 (1962), enf. denied 330 F.2d 885 (8th Cir. 1964).

[28] 330 F.2d 885 at 904. As noted above, the court of appeals denied enforcement of the Board's order. I note that in denying enforcement, the court did not criticize the judge's formulation of the standard for abnormally dangerous conditions. The court instead based its disagreement with the Board's conclusion on its view that the evidence of abnormal danger was inadequate. The plurality provides no reason for spurning this definition, from a case it cites with approval.

[29] Nothing in my position supports the plurality's charge that under my analysis an employer's failure to take reasonable, available measures to reach industrial norms shows ''ipso facto'' that Sec. 502 applies to the walkout. I would not use Sec. 502 to punish employers that may be violating other statutes. Rather, I would consider the employer's efforts to safeguard employees as a factor in determining whether ''abnormal dangers''—as opposed to ''normal dangers''—prevail. In this respect, I freely admit my differences with the plurality, which has devised a standard under which an employer's neglect of safety is its best defense.

[30] I agree with the judge's factual findings and her conclusions, and I have based the following account and analysis of conditions at the TNS plant on the complete and detailed factual record the judge has developed. I present here a brief summary, not to be taken as an exhaustive account of the facts on which I rely.

ployees not only because of its radioactivity but because, as a heavy metal, it is extremely irritating to human tissues and difficult to excrete. Lung and kidney damage can result from exposure to heavy metals.

Uncontroverted testimony portrays prewalkout safety operations at TNS as haphazard, with much equipment in disrepair and a marked lack of managerial or supervisory focus on safety or health regulations and procedures. Greensalt frequently spilled, and, despite special handling requirements, usually stayed on the floor until the cleanup period at shift's end because no production break was ordered for immediate cleanup. Greensalt also leaked from the broken blender, mended with duct tape; these spills also stayed on the floor and circulated through the shop on air currents, employees' shoes, and the tires of inshop vehicles. Retorts frequently overflowed and leaked greensalt when moved about within the shop. Employees packed greensalt into retorts by hand; the ventilation collar, intended to keep the greensalt dust from rising into their faces, seldom worked. The furnaces for firing greensalt had no protective shields, so that employees had no protection from dust and smoke from frequent furnace ''blowout'' and ''puffout'' accidents; supervisors rarely cleared the building following such incidents, unless the smoke was so thick that production was impossible. TNS management rarely took air quality measurements after blowouts and employees waited until shift's end to clear away dust and debris. The judge inferred that thousands of pounds of uranium metal were released into the shop atmosphere during the 5 months before the work stoppage.[31]

Nearly every operation at TNS involved direct contact with greensalt, and inadequate, or broken equipment increased DU's contact with human tissue. For example, employees testified that TNS required them to work with inadequately cooled DU ''derbies'' that gave off smoke and sparks when struck to break off rough edges and waste. Employees prepared waste products for burial in a toxic waste site by hand, shoveling the slag into drums. The waste area, despite longtime employee complaints about its filth, contamination, and poor ventilation, was not enclosed until after the work stoppage. The down-draft ventilation table on which employees ''slagged'' derbies, or removed surface waste and irregularities, had insufficient suction to draw off toxic particles; the vacuum furnace, in which the volatile DU was fired under pressure, periodically blew up, emitting so much smoke and dust that the plant had to be evacuated. Employees cleaned the dense radioactive material from the furnace by hand, as the vacuum hose designed for the purpose lacked the suction to do the job. Employees were required to paint the exterior of one assembly by hand with brushes and sponges; they were not required to use respirators while doing so. The judge found that this part of the manufacturing process was especially hazardous, as thorium-234, a radioactive material emitting beta particles, floated to the top of the molten substance. The judge also found that TNS did not monitor for beta-particle exposure at this station.

Machinists who prepared billets for shipment worked by hand with saws and lathes to remove impurities and turn out billets of a standard size. Fires often broke out at the lathe; the operator testified that he did not wear a respirator when quelling the fires and had never been instructed to do so. In addition, grinders dripped water contaminated with oxide dust, vats of radioactive sludge overflowed onto the plant floor, and a fine mist of recirculating coolant contaminated with radioactive dust sprayed into the air.

Employee perceptions that safety conditions at TNS were inadequate were echoed over and over in the judgments of outside observers. As the plurality notes more extensively, TDRH informed TNS of problems in the radiation safety program after each inspection: as early as 1978, TDRH found a ''severe laxity'' in commitment to employee safety; it noted that the TNS radiation program ''did not appear to be administered adequately to provide the maximum degree of protection'' and noted that TNS had not properly notified it of exposure of personnel to radiation outside limits and noted that TNS was not adequately surveying radiation hazards. Subsequent TDRH inspections revealed, and TDRH criticized, deficiencies in training and safety procedures, excessive levels of radiation and contamination, and, less than 2 months before the walkout, the institution of a continuous, full-time respirator program.

In addition to TDRH, TNS's own retained experts, Radiation Management Consultants (RMC), criticized the plant's safety and health levels sharply in a report prepared for TNS management after the work stoppage. The survey found that TNS was deficient in six ''areas of non-compliance'': limiting concentrations of airborne materials to restricted areas; respiratory protection; surveys of emissions; release of effluents to unrestricted areas; personnel monitoring; and training and calibration. The consulting team commented in part:

> [T]here seems to be a lack of management commitment to a radiation safety program. . . . We observed many areas of noncompliance. These coupled with the past history of whole body and extremity overexposure should be of great concern to management. The plant health physics staff . . . is working to improve the program. However, plant management has to support these

[31] The failure of TNS to take measurements after blowouts makes exact factual findings impossible.

changes and has to pay strict attention to the program.''[32]

Finally, TNS management itself was aware of the serious problems in the plant. TNS Environmental, Health, and Safety Manager Hoynacki testified that in January 1981, he recommended to management that the plant's penetrator and billet shops be closed down until air quality improved, but that management vetoed that step. Further, as noted above, O'Brien candidly admitted that TNS management had acknowledged privately that the Union's contentions that the plant was dangerous were correct.

This summary merely outlines the evidence concerning the plant's safety that presented itself to employees, and I find that the General Counsel has clearly demonstrated objective evidence for a belief that abnormally dangerous conditions prevailed. Employees believed that they endured excessive and unnecessary exposure to toxic compounds; experts have verified that they did. Employees believed that TNS management lacked a commitment to their safety; regulatory agencies and experts verified that TNS management indeed lacked such a commitment. Employees believed that their training in health and safety procedures was inadequate or nonexistent; regulatory agencies and experts verified that their training was inadequate under Federal standards. Employees believed that TNS was substituting mandatory use of respirators for engineering control of air quality and that longterm respirator use was physically and psychologically impossible; regulatory agencies also believed that the respirator policy was longterm and verified that employees could not realistically be expected to wear the respirators for the periods of time TNS management expected. Employees came to believe that they were endangered by disease that would only become manifest in the future; experts have verified that the exposure they experienced could lead to future illness and death, as Chairman Stephens and Member Oviatt acknowledge.

In my view, conditions at TNS render the plurality's requirement that employees demonstrate a ''significant decline'' completely inappropriate. I agree with the findings of the Board's trier of fact, Judge Pacht, that conditions at TNS were so far below those prevailing in the industry and evidence of excessive exposure to toxins with no indication of a management commitment to improving safety conditions was so abundant, that the TNS employees were justified in viewing conditions as abnormally dangerous and in walking off the job when other efforts to correct the problems failed.

This standard and analysis, as well as the result, are fully compatible with the statute's language and with the Supreme Court's discussion of the law in *Gateway Coal v. Mine Workers*.[33] As I demonstrate here and in my discussion of the concurring position, both the plurality and the concurrence have distorted *Gateway's* language and holding. In *Gateway*, a Section 301[34] suit to compel arbitration, the Court held that a mine operator's reinstatement of foremen who had falsified air flow records was arbitrable under the parties' contract and that a district court had authority to enjoin the strike protesting the reinstatement. The Court found that Section 502 did not deprive the district court of authority because the lower court had mooted the issue of whether abnormally dangerous conditions prevailed at the mine by expressly requiring, as a condition of the injunction, that the mine operator remove the foremen from the mine. Thus, *Gateway* does not address whether, much less hold that, conditions at the mine were not abnormally dangerous. Contrary to the plurality, *Gateway* did not involve a viable issue of abnormally dangerous conditions, and it does not require that the complaint here be dismissed. What *Gateway* does require is that work stoppages under Section 502 involve an ''identifiable, presently existing threat to the employees that an abnormally dangerous condition for work exists.''[35] I believe that the General Counsel's case meets these requirements.

Earlier cases neither require nor follow the narrow approach that the plurality claims is mandated by their ''mine disaster paradigm.'' As the judge observed in *Combustion Engineering*, ''neither Section 502, nor the legislative history, limits the kind of danger that may be considered abnormal.''[36] Although the plurality's interpretation of *Gateway Coal* looks for ''immediate'' danger to employees,[37] nothing in the statute or binding precedent requires that employees must literally be fleeing for their lives to invoke Section 502. The plurality acknowledges that conditions at TNS were ''less than state-of-the art''; that employees were exposed to higher than permitted levels of airborne contaminants; that the Respondent's failure to cure dangers in the workplace was reprehensible; that exposure to radiation had been gradually increasing for the 18 months preceding the work stoppage; that the TNS employees endured greater exposure to toxic substances than did similarly situated employees; and that oversight agencies had regularly cited TNS not only for substandard conditions but also for its refusal to correct them. Yet,

[32] Report of Radiation Management Consultants (RMC), quoted in Gore Report, supra at 129, 134. The plurality's characterization of the RMC report as ''mixed'' is charitable. In truth, the report is sharply critical of TNS. Further, its characterization of DU, quoted by the plurality, as a ''rather innocuous isotope'' precedes the following observation, which my colleagues ignore: ''[TNS] must assume, as will the regulatory bodies, that since regulatory requirements are based on health and safety, not meeting such requirements represents a health and safety hazard.''

[33] 414 U.S. 368, supra fn. 2.

[34] 29 U.S.C. § 185.

[35] 414 U.S. 368 at 385–387.

[36] 224 NLRB 542 550 (1976).

[37] *Gateway Coal*, supra, 414 U.S. 368 at 385–387.

because the case involves no dramatic feature comparable to a runaway freight car or a canary dying in a mine shaft, Chairman Stephens and Member Oviatt would not find abnormally dangerous conditions under its first alternative. I believe, as does the judge, that conditions at TNS deviated from the norm or average so significantly that it was unnecessary to wait for conditions to undergo a drastic change—to wait, in effect, for the canary to be dead and buried—before the employees' walkout attained Section 502 protection.

b. *The plurality's second alternative: Have the employees demonstrated that they stopped work at the point where they reasonably believed, based on objective evidence, that further exposure would pose an unacceptable risk of injury?*

Again, I find that the facts found by the judge demonstrate that the employees did stop work at a point where they had a reasonable, objectively based belief, that further exposure to toxins in the TNS plant posed an unacceptable risk of injury. The plurality's opposite conclusion results, in my view, from its efforts to fit a fluid, longterm process of exposure and possible injury into a rigid framework. The effect is to erect an insuperable barrier of proof and thus to deny the statute's protections to employees who may be endangered by the longterm effects of toxins or carcinogens but are not yet symptomatic.

The plurality's test, as applied to the facts here, would work well in a world in which human beings were fully conscious of their own processes of cell division and tissue development. In such a world, employees might be able to say with conviction, ''Yes, this is the moment; if this level of exposure continues I shall certainly suffer renal failure in six years,'' and act accordingly. In our world, however, the human body's ability to resist injury differs in individuals and changes over time. To expect a group of workers to know when ''such a danger threshold had been reached'' appears, as a practical matter, to be entirely unrealistic, and to dismiss a complaint because the burden of proof has been defined in terms of scientific questions that at present cannot be answered will certainly assure that such allegations shall always be dismissed. Further, once a particular worker has reached a point where further exposure will cause measurable physical changes, it may already be too late to protect his health. Thus, under the plurality's test, employee action will be premature until a time when it may well be too late.

Under the plurality's application of this alternative, as with the first, timing is everything. The plurality requires employees to walk out just when their overexposure—for no one contends at this point that the TNS employees were not overexposed—reaches that magic threshold, where overexposure that was reasonably risky turns into overexposure that is unreasonably risky. This requirement is totally at odds with the statute's purpose. Section 502's wording shows that it is meant to enable employees to leave workplaces before injury occurs, not to quit it as an acknowledgement of injury. Board case law recognizes that Section 502 is preventive in nature.[38]

In addition, as the plurality admits, experts disagree on radiation's effects, tolerable exposure levels, when injury begins, and nearly every other aspect of occupational safety and health in this area. The plurality reacts to this plethora of fact and theory by placing an additional burden on the General Counsel, noting disapprovingly that ''the record does not even establish what that threshold level of exposure [beyond which further exposure constitutes an unacceptable risk] is . . . .'' The plurality fatally oversimplifies the evidence by supposing that one single level of exposure will apply to all employees.[39] The evidence indicates that the threshold differs from person to person, and, as the length of exposure would depend on when the employee had been hired, no single figure or date would necessarily cover all employees in the plant. Thus, the General Counsel's burden to provide a magic number applicable to all employees is impossibly heavy. The appropriate burden for the General Counsel here is to demonstrate, by the preponderance of the evidence, that employees had a reasonable, good-faith belief, based on objective evidence, that abnormally dangerous conditions prevailed at their workplace.

The plurality also finds Section 502 inapplicable to the work stoppage here because the Nuclear Regulatory Commission (NRC) and its agreement state

[38] See *NLRB v. Knight Morley Corp*., supra, fn. 12, 116 NLRB 140 (1957), enfd. 251 F.2d 753 (6th Cir.), cert. denied 357 U.S. 927 (1958) (cited with approval in *Gateway Coal*), in which employees faced the possibility of heat related sickness from elevated temperatures and humidity and blowing (nonradioactive) grit. The court found that, as the employees had left soon after the hazard commenced, the fact that none of them actually collapsed was immaterial to evaluating whether the threat actually had existed. The court implicitly recognized that the whole point of Sec. 502 is to get out before injury occurs and accorded Sec. 502 protection to employees who walked out because they *foresaw* the possibility of injury.

[39] Experts disagree even on what approaches should be taken to determine tolerable levels of low-dose exposure to radioactive substances and heavy metals, and on whether low doses are more carcinogenic the brief high exposure. See *Dead Reckoning: A Critical Review of the Department of Energy's Epidemiologic Research*, Physicians for Social Responsibility, The Physicians Task Force on the Health Risks of Nuclear Weapons Production (Washington, 1992) pp. 30–31.

I firmly believe that the Board must continue to analyze issues such as whether the employees reasonably believed, on the basis of objective evidence, that abnormally dangerous conditions existed at TNS in labor law terms. For that reason, I am unwilling to rely on the decision of sister agencies and I, like the administrative law judge, am intent on examining what the employees themselves had to work with in evaluating whether the TNS work stoppage meets the above criteria.

agency, Tennessee Division of Radiological Health (TDRH)[40] never found that the facility was ''so unsafe as to require the removal of employees from the plant on May 1, 1981.'' Although the plurality asserts that the inaction of the agencies is but one factor in deciding whether Section 502 covers a work stoppage, it appears that, absent extreme dereliction, an oversight agency's inaction raises a virtually irrebuttable presumption that the facility is not abnormally dangerous. In effect, then, the plurality shifts the focus of a Section 502 inquiry from whether the *employees* had a good faith belief, based on objective evidence, that conditions were abnormally dangerous, to whether the *oversight agency* had such a belief. In doing so, the plurality contradicts previous Board case law and, even more important, nullifies the effect of the statute.

In *Roadway Express*,[41] the Board found that Section 502 protected a driver who refused, on the basis of the vehicle's ''feel'' on the road, to operate a truck, even though a department of transportation safety inspector inspected it and found it safe to drive. The Board found that the driver's belief that the truck was unsafe was supported by objective evidence, citing his observation of the truck's shimmying and twisting on the road.

> Such evidence, we believe, is objective enough to lead a person to reasonably determine that he should not drive such a truck. We do not believe that [opinions] . . . that the truck was safe diminish the reasonableness of [the driver's] belief under the circumstances. Nor do we deem relevant in considering the reasonableness of [the driver's] activity the fact that the truck was subsequently driven safely for several hundred miles without repairs having been made.[42]

Under the plurality's analysis, this driver, who based his conclusion that the tractor was unsafe on his own experience and judgment, should not have received the statute's protection because the safety inspector did not pull the truck off the road. To the plurality, this case would have presented a mixed question of labor law and vehicle transmission issues, in the same way that in this case ''the epidemiological issues are inextricably intertwined with the labor law question.'' Yet the Board in *Roadway* was able to focus on the employee and the reasonableness of his beliefs without examining whether the inspector's beliefs with respect to the truck were reasonable. In binding precedent, the Board viewed the employee's concerns about the truck's performance as sufficiently objective to accord his refusal to drive it Section 502 protection. I see no way to reconcile the plurality's approach with that of this binding precedent.[43]

In addition, the plurality's unquestioning assumption that if TDRH or NRC had concluded that the situation at TNS had reached ''abnormally dangerous conditions''[44] it would have closed down the facility, or at least tried to do so, without delay, is unrealistic and arbitrary. To accord with the overall policies of the Act, the plurality's reasoning must rest on the assumption that employee safety is the chief priority of these agencies, as employee rights are the chief priority of the Act. This is not the case, however. The statement of purpose of NRC's enabling legislation, the Atomic Energy Act, demonstrates beyond doubt that employee safety is far from the agencies' paramount concern. Congress declares in relevant part that the nation's policy is that

> the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare, subject to . . . the maximum contribution to the common defense and security . . . [and] shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise.[45]

This statement of purpose contains no mention of employee safety or rights.[46] The plurality, noting that NRC and TDRH have implemented standards for the protection of public health and safety, argues that

[40] The plurality's statement that Kerr of NRC ''commended'' TDRH's regulation of TNS is hardly an accurate representation of Kerr's remarks. In fact, he stated that the overall Tennessee program was adequate to protect *public* health and safety, but that ''[w]e do not maintain a 100 percent oversight of agreement state licensing and compliance actions. However, we have increased our level of attention to their actions relative to TNS.'' Gore report at 245. Kerr went on to say that TDRH was carrying out its duties regarding TNS in an appropriate manner. Id.

[41] 271 NLRB 278 (1975).

[42] Id. at 280.

[43] In attempting to distinguish this case, the plurality appears to assert that in *Roadway* the truckdriver knew all about trucks and at TNS the employees knew nothing about toxins, so the plurality is justified in substituting outside agencies' judgment for that of the TNS employees. The contrast between the cases really shows something quite different, however. In *Roadway*, there was, in fact, nothing wrong with the truck, although the employee's instincts and experience, valued by the Board, told him that there was. In this case, the employees were, in fact, being overexposed to toxins, as their judgment, experience and efforts to educate themselves told them that they were. The key difference is that in this case, where the employees were shown to be correct, the Board plurality ignores their experience and judgment.

[44] These are dangers that are ''deviating from the normal condition or from the norm or average,'' *Fruin-Colnon Construction Co.*, supra 139 NLRB at 904 fn. 19.

[45] 42 U.S.C. §§ 2011(a)–(b).

[46] Neither does the Tennessee code provision (Radiologic Health Service Act, currently cited Tenn. Stats. 68-202-201 ff.) governing atomic energy and nuclear materials. As the plurality points out, the purpose of that statute is, in relevant part, to apply ''controls and regulations with respect to radiological health and safety to protect the health and well-being of the people of Tennessee.'' No mention is made of the health and well-being of employees who handle such substances.

under the applicable statutes and regulations, employees are members of the public, so that this concern for public safety involves, necessarily, concern for employee safety. While the statutes and regulations covering the nuclear industry do not ignore employee safety, it is plain that employee safety is not their chief priority; indeed, far from being synonymous with public safety, employee safety is subjected to different and vastly more lenient standards than public safety. In fact, the regulatory agencies apply very different standards to measure safe levels of radiation in employees as distinct from the public. As Wayne Kerr, then NRC director of office of state programs, testified to the Gore Committee, the level of radiation exposure considered safe for employees is 10 times as high as that set for an individual citizen, and over 20 times as high as that set for the public as a group. Kerr stated that

> [O]ccupational guidelines, regulations, or whatever they are called, are more liberal than those that are allowed for the population at large. You focus on a different segment of the population, a working segment; you don't have children involved; in the general population, you have to consider things like the younger population that are in it . . . .[47]

The plurality avers that I have pointed to nothing to suggest that NRC or TDRH would fail to seek closure of an abnormally dangerous nuclear facility because of countervailing considerations. I believe that I have shown why it is not reasonable to assume that these agencies would act promptly to close TNS down under those circumstances. However, my colleagues miss the point.[48] The plurality is setting out a presumption by which the General Counsel's factual showing in this case, and in future cases, will be judged: that an agency charged, among other things, with protecting worker health and safety, would necessarily seek plant closure if it found that abnormal dangers existed. In doing so, the plurality should show that the presumption is reasonable: that the two factors—existence of abnormally dangerous conditions and action to close the plant's operations down—are, in reality, likely to be causally linked.[49] In my view, they have failed to show such a linkage in this case. The plurality points to nothing beyond its unsupported assumption, which is, in this case, rebutted by the testimony of both state and Federal officials and the language of the the governing statutes themselves. I remain unconvinced that NRC and TDRH regulation obviates the need for Section 502. Apparently Congress felt as I do, as it has allowed Section 502 to remain the law even though state and Federal agencies have set guidelines for in-plant exposure to toxic substances.[50]

In addition, TNS' relations with TDRH hardly constitute laboratory conditions for testing the validity of the plurality's assumption that if TNS were abnormally dangerous to employees, TDRH would have closed it down promptly.[51] The record documents TDRH's difficulties in eliciting responses from TNS management. TDRH's officials frankly discussed its limited enforcement powers. Such evidence increases my unwillingness to depend unquestioningly on the regulatory agencies' failure to stop TNS from operating and demonstrates yet again the fundamental arbitrariness of the plurality's reasoning.

Moreover, safety legislation and oversight agencies do not relieve the Board of its statutory task of determining, from the point of view of the employees, whether they had a reasonable belief, based on objective evidence, that abnormally dangerous conditions prevailed at their workplace. The plurality notes that the Board has no place among experts on radiation, the risks associated with various exposure levels, and other technical, or scientific aspects of determining what constitutes abnormal danger to employees. While I grant that we are not experts in radiation health and safety, I note that Congress itself has told us that we have such a place, in the very act of passing Section 502, and the plurality itself concedes that the task of defining ''abnormally dangerous conditions'' lies with the Board and the reviewing courts. Thus, the issue here is, irreducibly, a labor law question and not an epidemiological one.

Further, the plurality's dependence on TDRH's inaction for its finding that no objective basis existed for

[47] Gore Report, supra at pp. 246–247.

[48] The General Counsel would, as in all cases, bear the burden of demonstrating that the employees' belief in the existence of abnormally dangerous conditions was reasonable.

[49] I note that the oversight agencies are presumed to apply a ''danger in fact'' test to the question of whether all or part of an employer's operations should be closed down. This standard is different from, and more stringent than, the Board's test for Sec. 502 protection: that the employees reasonably believed, based on objective evidence, that abnormal dangers exist in their workplace. Thus, I would not accord the plurality's presumption the virtually dispositive weight that they ascribe to it.

[50] The plurality also avers that they do not invoke the actions of NRC and TDRH as binding rules of law, but as factors the employees should have given ''significant'' weight to, but they ''apparently'' did not. It is plain that to the plurality, ''significant weight'' is nothing more than a formula for an irrebuttable presumption that, in the absence of extreme dereliction, a plant permitted to continue operating by regulatory agencies is not abnormally dangerous. I would not impose such a presumption.

[51] The plurality's confusion with respect to the statutory goals of NRC and TDRH goes even further, however. The plurality insists that an individual cannot form a reasonable belief about conditions in a nuclear plant without giving due consideration to the actions of the regulatory agencies. Such a standard is necessary, in the plurality's view, to prevent an ''end run''—presumably by employees—around the statutes applicable to worker safety. The plurality has missed the point of the Atomic Energy Act: it was passed to regulate the nuclear *industry*, not the employees. Perhaps this misconception has contributed to the plurality's confusion with respect to whose reasonable beliefs are at issue here—the employees' or the agencies'.

belief in abnormally dangerous conditions at TNS ignores the broad sweep of Section 502 and its emphasis on the *employees'* perceptions and judgment. Section 502 is superfluous when everyone agrees that a workplace is abnormally dangerous. Indeed, in every case in which the Board has found abnormally dangerous conditions, some party has contended that conditions were safe. Section 502's wording clearly indicates that Congress intended it as a self-help safety valve for employees who disagree when others who have a say in the matter, such as their employer, tell them their workplace is safe. Prior Board cases reflect this approach, although they have always demanded an appropriate showing of an objective basis for the belief. Employees have not lost the statute's protection even where they may have been mistaken as a matter of fact about the abnormal danger.[52] Thus, the plurality's assertion that I have marshalled not a single fact to support the TNS employees' fear that they were being overexposed to toxins could be directed as easily at some earlier Board findings that Section 502 protected employee actions.

In addition, the plurality seems to impose a requirement that employees exhaust administrative remedies under other statutes, by emphasizing the employees' failure to seek closure from TDRH before the walkout. Nothing in the statute provides a basis for inferring such an exhaustion requirement.[53]

I note that TNS was never found in full compliance with regulations and was viewed by the agencies as among the very worst in the industry. Moreover, the inherent limitations of oversight are well known and documented. William Graham, director of TDRH at the time of the walkout, candidly acknowledged to the Gore Committee that TDRH lacked sufficient resources to force nuclear operators to comply with applicable standards: Graham noted that TDRH's

> enforcement procedures consist of persuasion, and are ultimately followed by appropriate legal action if [TDRH's] directives are refused or ignored. In most cases . . . [TNS] agreed to correct the violations. At times, though, extensive negotiations were necessary to achieve compliance. This Division does not presently have the authority to levy civil penalties . . . [T]his case has demonstrated to us the need for this authority as an added tool in achieving compliance with our regulations.''[54]

Thus, while I agree with the plurality that the judgments of regulatory agencies should be considered in judging whether Section 502 applies, I accord far less weight than the plurality to the bare fact that TDRH did not pursue court action to shut the plant down. Consequently, I do not believe that the employees' failure to be convinced by that bare fact renders unreasonable their belief that abnormally dangerous conditions prevailed at TNS.

4. Member Raudabaugh's view

Member Raudabaugh takes the position that even if the General Counsel has demonstrated that the TNS employees reasonably believed, based on objective evidence, that working conditions were abnormally dangerous, their work stoppage would *still* be unprotected because the General Counsel has not shown that they walked out *solely* to protect themselves from the abnormal danger, as he contends *Gateway Coal* requires.[55] For Member Raudabaugh, then, the TNS work stoppage is not covered by Section 502 because the employees put it off until their collective-bargaining agreement expired on April 30, 1981, and some issues in negotiations were unresolved when the walkout occurred. My concurring colleague dismisses credited or undisputed evidence that workplace danger was the overriding cause of the work stoppage and finds that the parties' failure to settle all issues means that the work stoppage was fatally tainted by economic interests. As with the plurality, Member Raudabaugh's basis for analysis contradicts prior precedent and introduces a new and arbitrary standard. As Member Raudabaugh concedes, no binding Supreme Court rule justifies the holding that the existence of open bargaining issues when a walkout occurs removes that walkout from Section 502's protection.[56] Further, I believe that Member Raudabaugh's conclusion contradicts prior Board case law, is inconsistent with jurisprudential canons, is rebutted by probative evidence, and suffers from the same shortcomings as the plurality

[52] See *Roadway Express*, supra, fn. 41.

[53] Further, the plurality's disapproval of the employees' failure to call on TDRH directly until after the strike began conflicts with their emphasis on prompt withdrawal from the workplace. Under the Occupational Safety and Health Act, 29 U.S.C. §§ 651, 660(c)(1), employees are encouraged to use other means of correcting dangerous circumstances and have the right to leave the workplace if they believe that time is too short to pursue action though OSHA and the courts. See *Whirlpool Corp. v. Marshall*, 445 U.S. 1 (1979). In this case, however, the plurality actually penalizes the employees for delivering an ultimatum to the employer and allowing it time to respond, and further, for attempting to resolve their concerns about overexposure through collective bargaining.

[54] Gore Report at 231.

[55] Thus, even if the TNS employees successfully navigate the intricacies devised by Chairman Stephens and Member Oviatt, Member Raudabaugh would still foreclose them from Sec. 502's protection because they are unable to prove the truth of a negative statement. Under this rationale, employees will, in effect, be required to demonstrate the *absence* of any other reason for their walkout. Thus, Member Raudabaugh requires that employees demonstrate, not that their concern about abnormally dangerous working conditions caused their walkout, but that no other reason caused it.

[56] Member Raudabaugh denies that, under his analysis, this fact alone removes the TNS work stoppage from Sec. 502's ambit. But as I show below, he musters no other factual support whatever for the conclusion that the employees' reasons for stopping work were fatally tainted with economic motives.

opinion by failing to come to grips with the novel fact pattern presented in a case involving longterm exposure to slow-acting toxins.

a. *Board precedent*

In *Combustion Engineering*,[57] the Board upheld the finding that an employer violated Section 8(a)(1) by discharging employees who left the job because they were afraid that two drunk and belligerent coworkers would return to the site and make trouble. The judge found that the employees' departure was motivated in part by fear of a beating but that other reasons influenced their decision to stop work: the employees were also ''concerned and embarrassed'' that the aggressors' behavior would reflect badly on them and they wished to avoid, ''and preferred to assure avoiding, fighting with [the aggressors] not only because of the danger but also because fighting on the job, whether engaged in rightly or wrongly, in their experience meant discharge for all participants.''[58] In that case, the Board did not demand absolutely pure motivation to find that the employees' walkout was protected. Thus, Member Raudabaugh's ''sole cause'' position is inconsistent with settled Board precedent.

Member Raudabaugh would distinguish *Combustion Engineering* from TNS because in *Combustion*, in his view, the danger was such that if the employer acted to remove the drunken employees, the walkout would have ended. TNS, he implies, is different—and therefore Section 502 would not apply—because the Union did not make ''proposals designed to bring about an immediate correction of these conditions'' so that the walkout could also have ended quickly and decisively. I believe that his reasoning errs in two respects.

First, Member Raudabaugh ignores the fact that the Union *did* demand that TNS make changes to remove the immediate danger.[59] Second, he completely ignores the obvious fact that the danger presented in *Combustion* is not in any respect comparable to that in TNS. Thus, the employer's appropriate response in *Combustion*—to rid the worksite of two drunks—is not in any respect comparable to TNS' appropriate response—to reduce the excessive exposure to toxins in dozens of processes at dozens of locations within the plant arising from TNS's failure to correct hundreds of instances of malfunctioning or broken equipment, to follow cleanup and decontamination procedures, to provide proper equipment, and to provide employees mandated health and safety training.[60] The TNS employees' efforts to end the abnormal danger accordingly involved many proposals for change, some amenable to immediate action, some, realistically, requiring time to correct.

Member Raudabaugh's comparison of *Combustion Engineering* to TNS, then, amounts to telling the TNS employees that demanding that TNS ''fix the plant! All of it! Now!'' would be more likely to win Section 502 protection for them than their careful and explicit reference to previous safety checks and lists of problems, their acknowledgment, based on what they knew of the hazards, that some corrections would take time, and their willingness to give their employer a chance to make the needed changes, or at least get started on them, before embarking on a costly and painful work stoppage.

In addition, Member Raudabaugh has created a standard impossible to apply in a situation like that at TNS. That abnormally dangerous conditions are the ''sole'' cause of a walkout may easily be demonstrated in an emergency situation. By contrast, where no emergency exists, it may well be virtually impossible to prove sole causality, as employers and employees frequently have unresolved differences, even outside the context of collective bargaining. If Member Raudabaugh intends to limit Section 502 coverage to emergencies, where employees are running for their lives, he need only say so and it will instantly be clear that Section 502 will not protect the TNS work stoppage, nor any work stoppage involving longterm exposure to toxins. Member Raudabaugh's discussion of the plurality position, however, indicates that, in his view, section 502 does apply in cases of exposure to slow-acting toxins and that he is sensitive to the problems of proof and persuasion in this highly complex area. Thus, he appears to argue for a realistic approach to the existence of abnormal danger, but then to erect an insuperable barrier to Section 502 protection by crafting a causality test that employees facing abnormal dangers during negotiations or in nonemergency situations can never satisfy.

Further, his disclaimer that de minimis distractions will not obviate a ''sole cause'' finding will not, as a practical matter, give employees like those at TNS a crack at Section 502 protection. The ''de minimis'' exception, by definition, applies only to trivialities; employees and employers in situations where exposure to toxins is at issue may have other, *serious* differences over which neither side would take decisive economic action. In my view, the ''*but for*'' test, applied to this and similar situations, yields a fairer analysis and result. If the employees would not have stopped work

[57] 224 NLRB 542 (1976).

[58] Id. at 546.

[59] See ALJD infra at 1420–1421.

[60] Member Raudabaugh misinterprets my analysis. My point that the dangers at TNS are, because of their complexity, qualitatively different than those in *Combustion* means that the measures to remove the dangers at TNS would be qualitatively different than those in *Combustion*. Thus, I find my concurring colleague's differentiation among proposals directed at immediate dangers and proposals directed at longer term dangers misses the mark. In *Combustion*, a quick fix was available to the employer. In TNS, no quick fix was available.

''*but for*'' the abnormally dangerous conditions, then those conditions were the cause of the work stoppage. In this case, the General Counsel has amply demonstrated here that but for the abnormally dangerous conditions, the employees would not have stopped work.

b. *Member Raudabaugh's reading of Gateway Coal*

As support for his premise that no other motive, thought, or expectation can play any role in a Section 502 work stoppage, which he terms the ''sole cause'' test, Member Raudabaugh cites Gateway Coal's comment that ''a work stoppage called *solely* to protect employees from immediate danger is authorized by Section 502.''[61] My concurring colleague concedes that a reading of *Gateway Coal*'s quoted language in context demonstrates that it was not intended to announce a rule of law, and certainly not a rule governing all claims of Section 502 protection, regardless of their facts. Notwithstanding his recognition that the language he cites from Gateway is dictum, he still argues that *Gateway* establishes a causality test covering work stoppages over dangerous conditions in all circumstances. In doing so, Member Raudabaugh rejects fundamental principles of judicial interpretation.

In the relevant passage, the Court discussed the appeals court's finding that '''a refusal to work because of a good faith apprehension of physical danger is protected activity and not enjoinable, even where the employees have subscribed to a comprehensive no-strike clause in their labor contract.'''[62] The Court stated in full that ''[w]e agree with the main thrust of this statement—that a work stoppage called solely to protect employees from immediate danger is authorized by Section 502 and cannot be the basis for either a damages award or a *Boys Markets* injunction,''[63] and held that as the basis for the claim of abnormal danger had been eliminated, Section 502 did not bar the district court's injunction of the strike and that the dispute at issue was arbitrable under the parties' contract.

If this case involved an alleged violation of a no-strike agreement and a petition for damages or an injunction, the Court's words might carry the precedential force Member Raudabaugh ascribes to them. But that is not the case. The facts here are distinguishable from those in *Gateway Coal* on the very point on which he relies in fashioning the ''sole cause'' test, and, to make matters worse, the ''sole cause'' language is not an expression of, or even necessary to, the case's holding, as Member Raudabaugh concedes. Thus, the language on which Member Raudabaugh relies in dismissing the TNS employees' claim is not a rule of law or a case holding—it is dictum.

I believe my colleague errs by elevating dictum to ''test.'' In my view, it matters what question the Supreme Court decided in *Gateway Coal* and how the quoted language is related to the Court's holding. I find no basis to infer that the Court intended its comment to announce a ''test'' for Section 502 coverage under a no-strike clause, still less a ''test'' for work stoppages under factual circumstances not discussed, and not even contemplated, by the Court.

The more cautious approach to precedent that I advocate is justified by fundamental principles of jurisprudence. Chief Justice Marshall's seminal discussion of judicial interpretation in *Cohens v. Virginia*[64] is instructive:

> [G]eneral expressions, in every opinion, are to be taken in connection with the case in which those expressions are used. If they go beyond the case, they may be respected, but ought not to control the judgment in a subsequent suit . . . . The reason of this maxim is obvious. The question actually before the Court is investigated with care, and considered in its full extent. Other principles which may serve to illustrate it are considered in their relation to the case decided, but their possible bearing on all other cases is seldom completely investigated.

This statement of the proper uses of legal precedent applies all the more strongly in this case, where the ''general expression'' in *Gateway Coal* does not even correspond to the facts we scrutinize here. Thus, Member Raudabaugh's position that the allegedly ''mixed motive'' of the walkout removes it from the ambit of Section 502 is based largely, as he himself concedes, not on binding Supreme Court precedent but on policy considerations. I find the clear language of Section 502 overrides Member Raudabaugh's policy concerns. He would deny Section 502 protection to employees who have demonstrated that they stopped work because their lives and health were at abnormal risk because of no-strike clauses and notice provisions. I reject this approach. Once employees have shown that they are working in abnormal danger, as Member Raudabaugh has conceded here for argument's sake, their safety, and their jobs, should take precedence over such concerns, even if other matters are undecided between the parties. This analysis is consistent with the statute, and also represents the appropriate policy choice.

In his response to my dissent, Member Raudabaugh asserts that I ''ignore'' the Court's language. I do not. I merely point out the obvious: that in agreeing with a statement about Section 502's function in an explic-

[61] 414 U.S. 368, 385 (emphasis added).
[62] Id. at 385 (citation omitted).
[63] Id. at 387.
[64] Wheat 264, 399 (quoted in *Humphrey's Executor v. U.S.*, 295 U.S. 602, 607 (1934)).

itly described fact situation and then finding that the Section 502 issue is not before it, the Court is not setting a standard applicable to all fact situations in which the statute is invoked. Stated simply, *Gateway Coal* is silent as to this aspect of the case.

c. *Member Raudabaugh's factual analysis*

The judge's factual findings (undisputed by Member Raudabaugh) belie my colleague's conclusion that the employees' concern for abnormally dangerous conditions was not the cause of the strike. Member Raudabaugh marshals one single fact to support its conclusion that the work stoppage was caused, ''at least in part,'' by a desire to achieve a satisfactory contract: the employees waited to walk off the job until their agreement expired. Further, Member Raudabaugh dismisses the judge's conclusion that the employees ceased work because they believed that working conditions at TNS were endangering their health, as supported only by ''subjective'' evidence;[65] he prefers ''objective'' evidence as grounds for the conclusion that the union called the work stoppage, at least in part, to accomplish its bargaining objectives and to protest the abnormally dangerous conditions. The ''objective'' evidence Member Raudabaugh musters as support: one fact—bargaining issues remained on the table when the walkout occurred.

To describe Member Raudabaugh's factual showing as thin is an understatement. But when it is compared to the overwhelming evidence that the employees would not have walked off but for the abnormally dangerous conditions on which the judge relies, it brings to mind the fadeout of the Cheshire Cat in ''Alice in Wonderland,'' where all that's left is the smile. Further, Member Raudabaugh's inability to point to any fact other than that bargaining had not been completed is the best evidence possible that his ''sole cause'' test would preclude any group of employees under any circumstances from showing, if negotiations were ongoing, that they walked off the job because of abnormally dangerous conditions.

Even his effort to show that the ''sole cause'' test will work when no no-strike clause applies is undercut by record evidence. In this regard, Member Raudabaugh states that

> If the union simply informs the employer that the work stoppage will terminate upon the correction of the abnormally dangerous conditions, even if the economic dispute is unresolved, that would appear to establish, at least prima facie, that the sole cause of the work stoppage is the abnormally dangerous conditions.[66]

On March 10, John Bettis, Local Union president and delegate to the Atomic Energy Workers Council, sent TNS management this message:

> the employees will not return to work after April 30 until the items which are on the health and safety report have been corrected and TNS is safe and healthy for the employees to work. This includes items from past inspections as well as items which will be listed during the April inspection.

Bettis' message clearly informed TNS of the reason why the employees were going to walk out on April 30. This communication would appear to constitute ''objective'' evidence, as it states straight out what TNS must do to end the work stoppage. But Member Raudabaugh rejects Bettis' communication. Because Bettis gave it to TNS 6 weeks before the strike, and as ''much can happen in a period of 6 weeks,'' Bettis' letter cannot be the ''simple and clear statement of what it would take to end the strike,'' as it would have been to Member Raudabaugh if Bettis had sent it just as the employees walked out. I find Bettis'letter to be precisely such a simple and clear statement. I do not agree with my concurring colleague that Bettis' attempt to give TNS a chance to remove the dangerous conditions vitiates the letter's force as proof of the cause of the work stoppage, and I see Member Raudabaugh's reliance on nothing more than the passage of time as yet more proof that his ''test'' could never be passed by employees facing dangers from slow-acting toxins who are compelled to engage in a work stoppage during negotiations.

Member Raudabaugh avers that when the walkout occurred the parties were far apart on the length of the probationary period; the right to lay off employees for 10 days; the right to terminate employees on medical leave after 6 months; management rights; checkoff; shift assignments; and vacations. In fact, however, the differences as to probation, layoff, termination when

[65] This spurious distinction between ''objective'' evidence and the ''subjective'' evidence of employee testimony as to the reasons they walked off the job runs completely counter to the Board's analysis of the causes of the work stoppage in *Knight Morley Corp.*, supra at 145, in which employees walked off the job because a malfunctioning exhaust fan blew dust into and failed to cool the buffing shop. The employer argued that the invocation of § 502 was a pretext; the real reason was to ''enforce the demand made . . . before the shift . . . that the afternoon buffers be permitted to go home after working 2 hours in order to equalize their hours with those of the morning shift.'' In rejecting that contention, the Board relied on the fact that ''*the buffer witnesses testified that the reason* [emphasis added] was the heat and the dust, a reason which arose *later*'' (emphasis in original).

My concurring colleague points out that *Knight Morley* predates *Gateway Coal* and thus has no relevance here. On the contrary, if the Court, in deciding a Sec. 301 suit, felt that *Knight Morley*, alleging violations of Sec. 8(a)(3), were incompatible it would have said so. Member Raudabaugh's dismissal of *Knight Morley* as precedent points up *Gateway Coal*'s poor fit with this case: the facts are different, the statute is different.

[66] Member Raudabaugh, concurring, supra at 1365 fn. 4.

on medical leave, and the management-rights clause were integral to the dispute over what to do about the facility's hazards. Member Raudabaugh's view that these safety issues are the wrong kind for a Section 502 work stoppage ignores their relation to the underlying threat of toxic overexposure as well as the whole purpose of Ø 502. If an employer responds, in part, to employee concerns about overexposure to toxins by proposing to lay employees off at will, without pay, for up to 10 days, and explicitly refuses to guarantee that it will not use the layoff power against employees showing signs of toxicity,[67] I would find that the employees' concerns had not been addressed. After all, the whole purpose of Section 502 is to protect employees from job loss, if they face the necessity of leaving the workplace because of its dangers. Yet Member Raudabaugh brushes off the employees' unwillingness to accept layoff as a solution to overexposure as a mere economic concern. In doing so, he imposes the same ''run for your life'' straitjacket on the complex dangers involved in this case as the plurality analysis does.

The judge's findings refute, again and again, Member Raudabaugh's conclusion that nonsafety economic issues were a legally cognizable cause of the strike. On April 29, TNS's spokesman in negotiations, Kriska, presented TNS's final offer and stated that the parties were far apart on many issues and would not be able to resolve the differences. The Union's spokesman, Williams, replied, ''Our biggest problem is health and safety,'' and accused TNS of overexposing employees to toxic substances. Williams further accused TNS of, in the judge's words, ''trying to buy a contract with an attractive economic proposal but that they were 'still $2.00 low.''' The judge goes on to find explicitly that ''[a]t this point, although the Union had not formally accepted the economic offer both Abel [another Union representative] and Williams recalled that they indicated to the Respondent that the wage proposal was not a problem.'' Thus, Member Raudabaugh's representation that the Union felt that TNS was ''still $2.00 low'' regarding wages is misleading; in fact, as both Union negotiators indicated agreement with the final wage proposal, the statement was ironic in import.[68] Further, as the judge found, health and safety concerns far outweighed any other reasons at the union meetings where the employees debated, and ultimately voted for, the work stoppage. The judge cited and credited testimony of numerous employees as to their reasons for striking and concluded that the overwhelming weight of the testimony establishes that

> the employees rejected the Respondent's final proposal and voted to strike because they believed that the working conditions at TNS were endangering their health. . . . [T]he record shows that the Union expressed no real concern about Respondent's economic proposal in apparent recognition that it was not troublesome.[69]

The judge's findings with respect to poststrike bargaining also bear out her conclusion that workplace safety was the cause of the strike. TNS and the Union continued to bargain after the employees walked off the job; Steven Wodka of the International Union's health and safety department presented a union safety proposal, rejected by TNS; TNS commissioned the RMC report, but withheld its existence from the Union and assured the Union that the plant had been inspected and was safe. In fact, when negotiations finally appeared deadlocked after the July 16 session, the only issues remaining were the Union's health and safety language and the 10-day layoff, both safety concerns. These facts, found by the judge and not disputed by Member Raudabaugh, defeat his conclusion that the employees' reasons for stopping work were contaminated by economic concerns to the point that, even conceding that the employees were walking out over abnormally dangerous conditions, their action could no longer be protected by Section 502.

In my view, the evidence found by the judge amply demonstrates not only that the employees' belief in overexposure to dangerous substances caused the strike but that the employees acted from a belief that was not only reasonable, but in good faith. Member Raudabaugh's charge that the evidence is ''subjective'' completely misses the mark. In fact, the evidence satisfies two requirements for Section 502 protection simultaneously: it demonstrates that the employees' belief that they were being overexposed to toxins caused the strike and it demonstrates that their belief was held in good faith.

Thus, I agree with the judge that the TNS employees undertook the May 1 walkout because of a good faith, reasonable belief that the TNS facility was abnormally dangerous. Unlike Member Raudabaugh, I find this conclusion thoroughly compatible with the observation, also made by the judge, that some employees may have entertained simultaneous yearnings for a multiplicity of things both tangible and intangible. Peaceful relations with management or a signed, sealed, and delivered collective-bargaining agreement

[67] See ALJD infra at 1421.

[68] See ALJD sec. VI,E, 1981 Prestrike Negotiations, infra at 1425. Member Raudabaugh relies on this exchange and these findings by the judge as a factual basis for his assertion that the TNS work stoppage was caused by the Union's efforts to get a better wage agreement. I am baffled by his reading of the judge's findings. In view of the fact that the judge is finding, on the basis of *credited testimony*, that wages were not a decisive factor in work stoppage because substantial agreement had been reached on wages, I wonder what *would* convince my concurring colleague that the employees walked out over abnormally dangerous conditions. I suspect that no showing could succeed.

[69] Id. at 1428.

containing favorable provisions may have been among these desires. But desires are not the same as causes, and such simultaneity does not convince me that a cause cognizable at law of the walkout was nonsafety economic issues. There is nothing in the facts, as found by the judge, to indicate that the parties would have struck over the nonsafety related issues still open on April 30: checkoff, shift assignments, and vacation scheduling.[70]

5. Conclusion

In dismissing the complaint against TNS, the Board has doubly failed. It has failed not only employees who work in hazardous industries, but it has also failed employers of good faith. It is plainly unconscionable to require employees working under the conditions the judge found at TNS to risk job loss to save their own lives and health. It is ironic, too, that by walking off the job at midnight on April 30, 1981, the employees motivated TNS to make numerous changes in equipment and operations to increase safety—for the new employees hired as permanent replacements. Less obviously, it is also unconscionable to require that law-abiding employers compete at a disadvantage with employers that deliberately or negligently refuse to protect employee health. Yet both the plurality and concurring opinions do so and, what is more, they strain to do so by ignoring evidence that weighs against their respective conclusions and relying on dicta from earlier cases.

As I have discussed above, precedent does not compel that the 8(a)(3) allegations here be dismissed. In my view, the results reached by both the plurality and the concurrence are determined, not by case law, statutory language, or legislative history, but by unstated policy considerations that foreclose employee access to the statute. I believe that this case presents the Board with an opportunity to define the law relating to slow-acting toxins under Section 502, and that its definition should be guided by the policy that so clearly underlies Section 502: to accord employees protection from adverse consequences when they are forced to stop work because of abnormally dangerous conditions. Therefore, I respectfully dissent.

Paul L. Styles, Esq., George L. Card, Jr., Esq., and *Richard P. Prowell, Esq.,* for the General Counsel.[1]

David A. Grant, Esq. and *Betty Southard Murphy, Esq. (Baker and Hostetler),* Washington, D.C., for the Respondent.

William M. Earnest, Esq. and *Robert L. Thompson, Esq. (Elarbee, Thompson & Trapnell),* of Atlanta, Georgia, for the Respondent.

Helen DeHaven, Esq., of Knoxville, Tennessee, for the Charging Party.

William K. Shaw, Jr., Esq., of Portsmouth, Ohio, for the Intervenors.

DECISION

PART ONE: HISTORY OF THE CASE

STATEMENT OF THE CASE

ARLINE PACHT, Administrative Law Judge. Pursuant to charges filed by the Oil, Chemical and Atomic Workers International Union, AFL–CIO (OCAW or the Union), on December 3, 1981, February 19, 1982, as amended on February 23, 1982, and December 8, 1982, in Cases 10–CA–1709, 10–CA–17900 and 10–CA–18785, respectively, and two additional charges filed by OCAW Local 3–974 on February 8, 1982, as amended in Case 10–CA–17871, complaints alleging that Respondent violated Section 8(a)(1), (3), and (5) of the National Labor Relations Act (29 U.S.C. § 143 (1982)) (the Act) issued on August 18, 1982, and April 13, 1983.[2] The Respondent filed timely answers to the complaints denying that it had committed any unfair labor practices.

The above-cited cases initially came before Administrative Law Judge Benjamin Schlesinger on various dates between April 5 and September 27, 1983. During this period, the parties entered into a voluntary settlement of the 8(a)(3) and (1) allegations in Cases 10–CA–17871 and 10–CA–7900 which resulted in a dismissal of those complaints.[3]

By telegraphic order of October 25, 1983, the Board granted the Respondent's motion to recuse the administrative law judge and remanded the complaints for hearing de novo. The remaining issues in Cases 10–CA–17709 and 10–CA–18785 came before me for a hearing which began on November 7, 1983, and concluded April 3, 1985, after 67 nonconsecutive days of trial in Johnson City and other neighboring Tennessee communities.

II. PROCEDURAL BACKGROUND

The complaint in Case 10–CA–17709 avers in substance that the TNS employees ceased work in good faith because conditions at their place of employment were abnormally dangerous by virtue of their long-term exposure to unprecedented levels of uranium dust in conjunction with Respondent's inadequate health and safety programs, within the meaning of Section 502 of the Labor Management and Reporting Act (LMRA).[4] By its notice of permanent replace-

[70] Further, the existence of abnormally dangerous working conditions does not bring all of industry's other concerns to a halt; thus, I would not find the fact that collective bargaining continued after the work stoppage and involved, to a limited extent, economic matters, sufficient to convert the work stoppage to an economic strike.

Member Raudabaugh mischaracterizes my dissent in stating that I assert that the only basis I cite for my agreement with the judge that the strike was caused by the employees' concern for abnormally dangerous conditions is ''subjective'' employee testimony. My references to the record also point to numerous factors in addition to employee testimony. Therefore, I believe his critique of my approach on this score is misplaced.

[1] Styles served as the Government's litigation counsel at trial; Card and Powell submitted the brief on behalf of the General Counsel.

[2] The complaints were consolidated at hearing on motion of counsel for the General Counsel (General Counsel).

[3] Those complaints alleged that two employees were discriminatorily discharged.

[4] Sec. 502 of the Act states in pertinent part:

ment to and refusal to reinstate these employees on their unconditional offer to return to work, Respondent was alleged to have violated Section 8(a)(1) and (3) of the Act.

On March 1, 1983, Respondent moved the Board to dismiss the complaint for failure to state a claim on which relief could be granted, arguing that Section 502 applies only as when a contractual or statutory no-strike clause is in effect. Since the TNS employees struck after their collective-bargaining agreement, which contained a no-strike clause, had expired, Respondent maintained that as a matter of law, Section 502 could not be invoked. By order of March 7, 1983, the Board denied the Respondent's motion with leave to renew before the presiding administrative law judge.

On April 5, 1983, Respondent submitted its motion to dismiss the complaint to Judge Schlesinger. Thereafter, the General Counsel and the International Union filed briefs opposing Respondent's motion. While the administrative law judge had the matter under advisement, the Respondent orally moved to dismiss the complaint because it asserted a legally deficient ''subjective standard.''[5] In response, on June 13, 1983, the General Counsel moved to amend the complaint. By order dated August 11, 1983, Judge Schlesinger denied Respondent's motion to dismiss and granted the General Counsel's motion to amend. The amendment added the following language to paragraph 7 of the complaint: ''The Respondent violated the Act by permanently replacing employees who engaged in a work stoppage 'because such employees held a good-faith belief that their conditions for work at their place of employment were abnormally dangerous by virtue of . . . long-term exposure to unprecedented levels of uranium dust in conjunction with inadequate health and safety programs.'''

On August 18, 1983, Respondent again requested that the Board grant special permission for an appeal of the administrative law judge's August 11 order. By order of September 12, 1983, Respondent's request for special permission to appeal was denied for want of a majority. Members Zimmerman and Dennis ruled that the case should proceed with ''a record developed at a formal hearing before an administrative law judge'' whereas Chairman Dotson and then Member Hunt ''would grant the request for special permission to appeal, reverse the order of the administrative law judge with instructions to limit the hearing to questions bearing on the replacement of economic strikers.''

By Order of October 25, 1983, the Board (Member Zimmerman dissenting) granted Respondent's motion to recuse the administrative law judge and remanded the matter for a hearing de novo before a different administrative law judge. On my appointment to preside in this matter, Respondent renewed its motion to dismiss the complaint. After soliciting the parties' views on the applicability of the law of the case doctrine, I issued an order on November 4, 1983, denying the Respondent's motion to renew motion to dismiss, concluding that ''Where as here, a reviewing body is evenly divided, the judgment of the administrative law judge stands in full force and effect.''[6]

On January 13, 1984, while the trial was in progress, William K. Shaw, Jr., Esq., moved to intervene on behalf of 70 of the former TNS strikers in their individual capacity.[7] By oral ruling on February 6, 1984, I granted limited intervention to examine witnesses about their alleged interest in striking prior to May 1, 1981, and to present an expert scientific witness.

At the close of the General Counsel's case-in-chief, the Respondent again moved to dismiss, arguing as it had in previous motions, that the complaint failed to state a cause of action and that the General Counsel failed to establish a prima facie case. After taking the matter under advisement, I denied the Respondent's motion on April 13, 1984. (Tr. 7623–7624.) Respondent sought special permission from the Board to appeal the denial of its renewed motion to dismiss. On May 4, 1984, the Board rejected Respondent's special appeal request ''for want of a majority by a 2–2 vote.[8]

During the final days of hearing, December 17 and 18, 1984, counsel for the Intervenors and the Respondent presented for my approval settlement agreements and releases executed by a number of the discriminatees. Both the General Counsel and the Charging Party opposed the settlements. After hearing the parties' oral arguments, I rejected the proffered settlements finding them deficient in an number of respects. (Tr. 12557–12577.)

Shortly thereafter, Respondent appealed my ruling rejecting the settlements to the Board and concurrently renewed its motion to dismiss the complaint for failure to state a claim upon which relief could be granted. Oppositions were filed by the General Counsel and the Charging Party. By telegraphic order of February 22, 1985, the Board approved the settlements in principal.[9]

On April 22, 1985, the Union, Intervenors, and Respondent stipulated that the employees knowingly signed the settlements, and filed a joint motion with the Board requesting that it amend its February 22, 1985 order by revoking the hearing on the employees' informed and voluntary consent to

nor shall the quitting of labor by an employee or employees in good faith because of abnormally dangerous conditions for work at the place of employment of such employee or employees be deemed a strike under this Act.

[5] Respondent's motion came during a June 9, 1983 telephone conference call among the parties.

[6] The order appears in the record as General Counsel's Exhibit 1 (nnnn). Hereinafter, the following abbreviations will be used in referring to the parties' exhibits: General Counsel's Exhibits—G.C. Exh.; Charging Parties' Exhibits—C.P. Exh., Respondent's Exhibits—R. Exh.; Intervenor's Exhibit—I. Exh. The transcript of the proceedings will be cited as Tr.

[7] Shaw previously moved to intervene on behalf of the OCAW Local at TNS. That motion was denied by Administrative Law Judge Schlesinger.

[8] Members Zimmerman and Dennis decided that the matter could best be resolved on the basis of a complete record developed before the administrative law judge. Chairman Dotson and Member Hunter would have granted the appeal and transferred the case to the Board for decision.

[9] The Board remanded the matter to me to determine whether the employees executed the settlements and releases with informed and voluntary consent. Thereafter, on March 1, 1985, the Intervenors filed a motion for partial disqualification and recusal of the administrative law judge urging that I remove myself from such a hearing. The Respondent filed a pleading supporting the Intervenors' motion; the Charging Party opposed the motion to disqualify and the General Counsel took no position. Because of actions taken subsequently by the Board and the Court of Appeals for the District of Columbia, it has been unnecessary thus far to rule on the Intervenors' motion.

the settlement agreements. Thereafter, by telegram dated May 16, 1985, the Board approved the settlements. However, in a 2 to 1 ruling (Chairman Dotson dissenting), the Board denied the motion to dismiss without prejudice to the Respondent's right to renew its contentions before the administrative law judge. Subsequently, on October 23, 1985, the Board amended its May 16 order sua sponte, and offered and expanded its rationale for approving the settlement.

The Charging Party then petitioned the United States Court of Appeals for the District of Columbia for a review of the Board's acceptance of the settlements. On December 2, 1986, the circuit court reversed the Board's Orders and remanded the case for further proceedings. *Oil Workers OCAW v. NLRB*, 806 F.2d 269 (D.C. Cir. 1986).

Based on the voluminous record in this case containing close to 13,000 transcript pages[10] and hundreds of exhibits,[11] my observation of the demeanor of the witnesses and careful review of able posttrial briefs filed by the General Counsel, the Charging Party, and the Respondent, I enter the following

PART TWO: FINDINGS OF FACT

I. JURISDICTION

Respondent, TNS, Inc., a Tennessee corporation with an office and place of business located in Jonesboro, Tennessee, manufactures and sells ''GAU-8 cores'' or penetrators, armor-piercing projectiles. During the calendar year preceding the issuance of the complaint, Respondent sold and shipped from its Jonesboro facility products valued in excess of $50,000 directly to customers (principally the United States Air Force) located outside the State. Based on the foregoing, the Respondent admits and I find that TNS, Inc. is now and has been at all times material herein an employer engaged in commerce within the meaning of Section 2(2), (6), and (7) of the Act. I further find that the Charging Party OCAW is a labor organization within the meaning of Section 2(5) of the Act.

II. THE PARTIES' CONTENTIONS

At midnight on April 30, 1981, some 100 men and women employees of TNS began a work stoppage which they claimed was the first concerted protest against abnormally dangerous working conditions in the history of the nation's labor movement. At that time, these workers could not have foreseen that their strike[12] would give rise to complex and unprecedented questions of fact and law and thrust them, their Union, and their employer into protracted litigation.

From the employees' perspective, the issue was relatively simple. They worked at a plant which used depleted uranium (DU) in the manufacture of penetrators, as they were commonly called. The employees came to believe that in working with this substance which is both radioactive and chemically toxic, they were consistently overexposed to hazardous contaminants which subjected them to grave health risks. The employees raised concerns about their working conditions to management, hoping that the situation could be rectified through collective bargaining. However, the Respondent failed to accede to the Union's demands to take corrective action regarding the health issues, contending that such demands intruded into management's prerogatives. Therefore, when the labor contract expired with no new agreement reached on the health and safety issues, the employees refused to return to what they perceived as a hazardous worksite.

While their strike was in progress, the employees heard from various experts who bolstered their view that conditions in the plant were subjecting them to abnormal health risks. Therefore, despite assurances from management that the plant was safe, the employees remained on strike until February 15, 1982 when the Union made an unconditional offer on their behalf to return to work.

The Respondent takes a drastically different view of the dispute. Relying on expert testimony, Respondent claims that its employees were never subjected to abnormal health risks. Respondent further contends that it was in compliance with Federal and state health standards and that the NLRB should defer to the state regulatory agency on the question of whether the employees worked under abnormally dangerous conditions.

Respondent also insists that health and safety issues were not the principal matters separating the parties during collective bargaining; rather, such matters became a staged rallying cry to unite the workers in the strike action and to deflect attention from other economic issues which were preventing agreement. Therefore, the Respondent argues that the employees did not strike because of a good-faith belief that working conditions were abnormally dangerous. Rather, the strike was economic in nature, entitling the Company to lawfully hire permanent replacements beginning in July 1981, and to refuse to reinstate the former strikers after they unconditionally offered to return to work.

These opposing positions give rise to the following questions of fact and law: (1) did the employees commence a work stoppage on May 1, 1981, because of a good-faith belief that working conditions at their place of employment were abnormally dangerous; (2) does objective, scientifically verifiable evidence support the employees' belief that their working conditions were abnormally hazardous; (3) was the work stoppage, which commenced on the day that the collective-bargaining agreement expired, a cessation of labor within the meaning of Section 502 of the Act, or an economic strike; (4) if the strike is cognizable under Section 502, did

[10] The parties submitted a Joint Exhibit correcting the transcript. That exhibit is received into evidence and is attached to this Decision as Appendix B. In addition, Respondent filed a separate motion to correct a portion of the transcript relating to the testimony of one of its expert witnesses, Dr. Clarence Lushbaugh. Since the reporting service had erased the relevant tape of the transcript, the parties were unable to stipulate to the accuracy of Dr. Lushbaugh's alleged testimony, and my own notes and independent recollection provide no guidance on this matter, it would be inappropriate to alter the record. Accordingly, Respondent's motion to correct the record is denied.

[11] Subsequent to the hearing and with the court's consent, the General Counsel offered into evidence G.C. Exh. 102, to which the Respondent objected. I find that the exhibit does not add significantly to other evidence in this case and, therefore, reject it. (G.C. Exh. 102 will be entered into the rejected exhibit file.)

[12] A central issue in this case is whether the employees' action was a work stoppage within the meaning of Sec. 502 as the General Counsel and Charging Party claim, or simply an economic strike as the Respondent contends. Pending resolution of this issue any reference to the employees' concerted activity as a strike, implies no legal conclusion, but is used simply for brevity's sake.

Respondent violate Section 8(a)(3) and (1) of the Act by permanently replacing employees, and is it then obligated to reinstate the former strikers?

Several ancillary issues also must be addressed: did Respondent violate Section 8(a)(5) and (1) of the Act by refusing to meet and bargain with the Union; did Respondent violate Section 8(a)(1) of the Act through certain comments made by an official with respect to the seniority status of reinstated workers; and if the strike was economic in nature, were the former strikers denied their proper reinstatement rights following their unconditional offer to return to work?

III. THE PRODUCTION PROCESS—SOURCES OF CONTAMINATION

Overview

TNS began in 1967 as a small, closely held corporation engaged in the manufacture of depleted uranium (DU) metal and thorium at a plant in Jonesboro, Tennessee. During this early phase of its existence, TNS produced uranium ingots or ''derbies,'' so named for their rounded, hat-like appearance.

The manufacture of derbies began in the TNS foundry where uranium tetrafloride (UF^4) (commonly called greensalt for its green, flour-like texture) was blended with small proportions of magnesium. This mixture was poured into retorts (or pots) and heated to temperatures of 3000 Fahrenheit in reduction furnaces where the uranium compound was converted into a pure metallic state. In its molten form, the uranium mix settled and solidified at the bottom of the retort. After cooling the uranium metal emerged as a 300-pound dome-shaped derby.

Prior to 1980, TNS also produced thorium oxide compounds in a section of the plant designated as the thorium bay.[13] TNS sold these products on the international market.

In 1976, Aerojet General Corporation, a Division of General Tire and Rubber Company, purchased TNS. Thereafter, the Respondent's operations expanded dramatically. By 1978, the production of 300-pound derbies had increased by 300 percent. TNS ceased producing these small derbies in the fall of 1979, replacing them with derbies weighing 400 and 1200 pounds. In the same year, rather than selling the derby as its end product, TNS began to convert them into ingots or billets; that is, uranium alloy castings which are formed by remelting two 1200-pound derbies in huge, intensely heated vacuum furnaces.

Prior to the work stoppage in May 1981, the billets were shipped to an out-of-state independent facility where they were extruded into thinner and longer rods. After extrusion, the rods were returned to a new production area at TNS known as the penetrator shop where they were cut, tooled, and honed, finally emerging as Respondent's ultimate product, the GAU-8 penetrator core. These penetrators were sold exclusively to the United States Air Force which, because of the penetrators' density and pyrophoric quality, served as an effective projectile for piercing armored tanks.

During each phase of the production process at TNS, contamination; that is, radioactive particles from greensalt, uranium oxides and uranium metals were released into the plant's atmosphere.[14] In working with DU, TNS employees routinely faced two potential health risks. First, DU is a carcinogen. It is mildly but definitely radioactive. Consistent exposure to even low levels of radioactive levels of radioactive contaminants released into the working environment during the production process may result in cancer. Second, as one of the heaviest and densest metals known to man, uranium poses another, possibly greater hazard to human health by virtue of its potential to poison the kidneys.

As a user of a radioactive substance, TNS was required by Federal and state regulations to reduce these health risks to acceptably low levels by implementing various operational controls on its methods of production. Respondent also was legally obliged to protect its work force from excessive exposure to DU by maintaining a sound health and safety program which included among other things, monitoring the workplace and the work force to detect and prevent impermissibly high levels of contamination.

The General Counsel and Charging Party contend that operational practices at TNS were unsound and when coupled with inadequate health and safety programs, converted what should have been a minimally hazardous workplace into one which was abnormally dangerous. Respondent denies this. The crucial factual question in this case is, then, whether the TNS employees were subjected to unancceptably high levels of DU contaminants which posed abnormal risks to their health. An answer to this question starts with the review of Respondent's operations and working conditions as the employees experienced them prior to May 1, 1981.

A. *The Foundry*

Prior to the inception of the penetrator shop in 1980, Respondent's principal functions were carried out in the foundry which was subdivided into two main areas—the small derby shop where 400-pound derbies were fashioned, and the large derby shop where the 1200-pound derbies were produced and then shaped into billets.

1. Weighing and blending

The production process at TNS began with receipt from the Department of Energy of 55-gallon drums of greensalt which, in spite of its powdery consistency, is an extremely heavy radioactive compound. The employees' first brush with the hazardous substance occurred when the drums of greensalt weighing 1600 to 1700 pounds each were transferred by forklift from the TNS warehouse to the foundry's weighing and blending station. During the transfer, the greensalt barrels frequently were pierced by the forklift tines or dropped from the lift, spilling the greensalt onto the floor of the warehouse and the foundry. Employee Roy Johnson estimated that major spills occurred once every 7 to 10 days. Small spills were more frequent.

[13] Like greensalt, thorium is radioactive.

[14] The words ''contaminants'' and ''contamination'' are used throughout this Decision to describe the inadvertent and uncontrolled release of radioactive or chemically toxic materials to the working atmosphere. Contaminants may become airborne in three ways: (1) by disturbance of contamination which lies on the surfaces of working areas; (2) by operations which generate dust and (3) by the drying out of liquid contamination. See A. Martin & S. Harbison, *An Introduction to Radiation Protection* (2d ed. 1979) 107, 129.

Federal regulations and Respondent's own operating procedures required that when such spills occurred, the area had to be cordoned off and vacuum cleaned immediately; then monitored for lingering airborne radioactivity by a member of Respondent's health and safety staff. The evidence shows that these desirable precautions existed on paper but not in practice. With the exception of one witness, no employee recalled seeing a greensalt spill roped off or cleaned up promptly.[15] To the contrary, several employees testified credibly that the supervisors advised them to remove the spills during the general cleanup which occurred at the end of the shift. In the interim, the spilled greensalt was tracked throughout the foundry by foot or by passing towmotor. All too often, the employees cleaned up the spills with shovels and brooms, further rousing contaminated dusts into the air.

At the weighing and blending station, the barrel of UF_4 was hoisted and its contents poured into the blender below until a prescribed weight was reached. A proper amount of magnesium was added, the blender was rotated, and the mixture was poured into a waiting retort. Due to faulty gaskets on the blending device, which the Respondent attempted to mend with duct tape, quantities of the greensalt mixture leaked onto the floor surrounding the unenclosed blender. The greensalt did not lie dormant for air currents, passing employees and towmotors all helped to track the substance to other areas in the shop.

Blending for the 1200-pound derbies involved a somewhat different method: a more modern piece of equipment, encircled by a chain link fence, was utilized. Here, an employee placed a drum of greensalt on the scale and manually removed some of it until the drum reached a prescribed weight of 1550 pounds. The greensalt drum itself became the blending device by bolting an extension sleeve to it through which a small amount of magnesium was added. As this contraption was inverted, greensalt escaped from the joints between the blender and the drum. As with the small derbies, the drum was rotated and its contents poured into a retort.

The cylindrical retort or pot which held the greensalt mixture was composed of an outer sealed shell, one-half inch thick and 5 or 7 feet high depending on its use for either the small or large derby. A graphite liner was inserted into the pot and separated from the wall of the retort by dolomite, an insulating material. The greensalt-magnesium blend was poured into the retort, often to the point of overflowing. As the retorts were transported to the packing area, a stream of the mixture followed in the towmotor's wake.

Following the strike, Respondent completely reengineered the weighing and blending process. The blending equipment was dismantled and buried in a hazardous waste disposal site. Improved weighing and blending instruments now are housed in a ventilated enclosure and operated by remote control and a new dust collector was installed at the site. In addition, Respondent constructed a tunnel-like sheet metal structure to enclose the route through which an automatic conveyor transported the retorts to and from the surrounding area. Double-layered, plastic curtains also were installed at the entrance and exit to the tunnel to halt the flow of air currents or drafts from the towmotor exhausts which, in prestrike days, blew the fallen greensalt from place to place. At the hearing, Jerome Hoynacki, manager of health and safety at the time of the work stoppage, testified that the curtains were not intended to contain radiation but to reduce noise levels. A letter of June 21, 1982, from Stephen Prewett, then TNS Director of Environmental Health and Safety to the Tennessee Department of Radiologic Health (TDRH), contradicts Hoynacki's testimony. (G.C. Exh. 76jj at 2, 4–5.) It praises the beneficial effects of the curtains and touts their ability to contain the contaminating dusts.

2. Retort packing

In the next stage of the production process, employees packed the green salt mixture firmly into the pot with a tamping device, leaving a 2- to 3-inch margin at the top of the retort. If the retorts were not sufficiently filled or contained too much of the blend, employees had to make appropriate adjustments. To do this, a barrel containing the mixture was kept nearby and material was either added or extracted by hand.

During the tamping process, the greensalt mixture flew up from the pots and settled into the workers' ears, nostrils, and mouth, and also fell to the floor in 3- to 4-foot wide swaths. A horseshoe-shaped ventilatory collar connected to air lines were attached to the retorts. These devices were supposed to exhaust the dust but seldom worked effectively. The employees found them more of a hindrance than help and often failed to use them, a fact known to at least some of Respondent's supervisors. Plant engineer Joe Romaine, for one, admitted that the collars seldom were used. Another supervisor, Ronald Jones, told an employee who was packing pots not to get caught if he was going to omit the collar.

3. The reduction furnaces

After a pot was filled and sealed under a steel cover, it was transferred to one of 10 reduction furnaces in either the small or large derby shop. The furnace was heated to a high point of 3000 degrees at which time a chemical exothermic reaction occurred (referred to as ''firing'') causing the floride to separate from the uranium and merge with the magnesium. Ideally, when heated to a molten state, approximately 94 percent of the uranium blend should have fallen to the bottom of the retort and condensed into a derby shape. However, practice was less than perfect, for a much smaller percentage of the uranium generally materalized in derby form. Instead, varying amounts of the uranium coalesced with other materials (floride and magnesium) to form a cap over the derby, commonly called slag.

The exothermic reaction within the pot often was so intense as to cause a sudden eruption of smoke, sparks, flames and hot metal. Such incidents were referred to as puffouts or blowouts, depending on their severity and the amount of material expelled from the furnace. The term ''puffout'' was used when modest amounts of smoke escaped from the furnace and lingered in the atmosphere for 3 or 4 minutes. Under these circumstances, the employees did not put on respirators since the incident would be over by the time they

[15] The Respondent presented one witness, Jean Smith, who was still employed in the TNS quality control section, who testified that she observed seeing a greensalt spill cleaned up in the prescribed manner. I find that the consistent and credible testimony of other employees' concerning the methods they saw and used in cleaning greensalt spills outweighs and overcomes the testimony of Respondent's single witness who recalled just one experience.

could retrieve their apparatus from the lockers in which they were stored.

Blowouts varied in force. Some produced showers of sparks while more severe ones filled the shop with smoke and quickly oxidizing particles of inflamed uranium. On occasion, holes were burned through the steel walls of the furnace. Sight glasses (an optical device which permitted an employee to visually inspect the furnace's interior) also were blown out. Other times, the blowouts were spectacular and terrifying. Several employees vividly recalled an episode in which a 700- to 800-pound steel furnace lid was hurled 15 feet into the air denting a steel beam in the ceiling of the facility. The operator who was tending the furnace was thrown across the room by the force of the explosion.

Because the furnaces were not surrounded by protective enclosures, the employees were not insulated from the contaminated material expelled during the course of a blowout. Supervisors had the discretion to order the building evacuated in the event of a blowout, but apparently rarely exercised it unless the smoke caused by the blowout so impaired the employees' vision that it was impossible for them to work or breathe. On such occasions employees would be cleared from the building. Sound health practice dictates that trained personnel should measure the air quality in the vicinity of the furnaces before employees are permitted to return, but this seldom was done at TNS. On the later shifts when no health and safety personnel staff were available, such measurements never were made. Instead, supervisors simply called the employees back to their jobs once they decided the smoke had subsided sufficiently.

Employees cleaned up the oxide dust fallout which covered the floors and other surfaces of the shop during the half-hour period set aside for such purposes at the end of their shift. Other employees were assigned to scoop oxide from the interior of the furnace or repair any damage to the insulating bricks which lined the furnace walls.

A number of employees estimated that blowouts occurred in the small derby furnaces as frequently as two or three times a shift. Hoynacki suggested that the blowout rate in the small derby furnace was approximately 10 percent of the total number of firings which occurred there. However, these approximations could not be verified since the small derby production records, subpoenaed by the General Counsel, were too contaminated to be copied without ruining Respondent's duplicating equipment. Consequently, it is impossible to determine just how much uranium contamination was expelled into the atmosphere during such blowouts.

Respondent did produce records for the large derby process covering a 5-month period prior to the work stoppage. Relatively speaking, blowouts in the large derby area were less frequent than those in the small derby shop. The Respondent's records show that 80 blowouts or flameouts, as they also were known, occurred on 106 productions days, or roughly 3 out of every 4 working days.[16]

Since Respondent did not regularly monitor or record air quality levels following large derby blowouts, here too, there is no way to calculate precisely how much uranium either was imbedded in the slag or erupted and oxidized into the working environment. However, Respondent's production records do permit reasonable deductions as to the total amount of contaminant produced during blowouts. By subtracting the weight of the finished derby from the amount of greensalt initially used for the pour, the total amount of contamination lost one way or the other may be derived. Between December 1, 1980, and April 24, 1981, under optimum conditions, the large derby reduction process should have yielded uranium metal derbies weighing 961,000 pounds. In fact, the production records show that the actual yield was 629,518 pounds, leaving 331,482 pounds of uranium to be accounted for in some form other than derbies. Not all of the escaping uranium could have been absorbed into slag, since according to the Respondent, that was composed principally of magnesium and flouride. Thus, the only reasonable inference is that thousands of pounds of rapidly oxidizing uranium metal erupted into the working atmosphere at TNS during the numerous blowouts which occurred in the 5 month period preceding the strike.

The extent to which employees were exposed to uranium oxide expelled into the atmosphere during blowouts is of considerable significance in this case. Uranium oxide, or U_3O^8, is a relatively insoluble compound. This means that when ingested or inhaled, it is not quickly expelled from the body. Instead, it lingers, primarily in the lungs, for a prolonged period of time where it may do far more damage than soluble compounds which are more readily excreted. Thus, uranium oxides, together with greensalt, formed a major source of contamination in the foundry.[17]

Respondent was familiar with the concept and techniques of shielding equipment to contain contamination, for a few of the 300-pound derby furnaces were enclosed before the operation was abandoned. Not until after the work stoppage did Respondent enclose and ventilate the reduction furnaces used for the larger sized derbies. Blowouts may have occurred, but at a presumably reduced rate, and employees were shielded from the expelled smoke and uranium oxides.

4. Derby breakout

After a brief cooling period in the furnace, the retorts were removed to a pad outside the foundry where they were supposed to cool for some 12 to 16 hours before being returned to the breakout area. In fact, employees recalled working with derbies which were still hot and smoldering. Since uranium oxidizes rapidly while warm, working with inadequately cooled derbies exposed these operators to substantial quantities of uranium oxide particles.

At the breakout station, the small derby was extracted from its vessel in the following manner: an employee attached the pot to a jolter mechanism and activated a valve within the jolter which, by its vibrations, should have dislodged the contents of the pot onto a grid plate implanted in the floor. However the jolter did not always function as planned. As much as 50 percent of the time, the workers had to pound on the sides of the vessels with sledge hammers to dislodge the derby. When the derby broke lose from its pot, it fell to the floor accompanied by quantities of slag, smoke and burning bits of metal oxide. Not all of this debris was

[16] Since the number of blowouts admittedly was greater in the small derby area, Hoynacki's 10-percent blowout estimate clearly was lower and less accurate than that offered by the employees.

[17] As will be discussed below, U_3O^8 also was a major contaminant in the penetrator shop.

captured by the ventilation ducts which bordered the grid plate. As a result, the plate often was clogged.

The derby then was hoisted onto a downdraft table,[18] which had a gridlike top through which the burning bits of metal oxide could fall to a tray below. One employee at a time also had access to a single ventilated booth equipped with an air chisel for slagging the derby.[19] Other employees slagged derbies on the shop floor, sitting on one derby while they worked on another with hammer and chisel. As employees slagged the derbies, black dust containing uranium oxide flew upward into their faces.

Employees next shoveled the slag into 55-gallon drums which also were encircled by the horseshoe collars previously described. The slag removed from some 15 to 25 small derbies each shift filled 2-1/2 55-gallon drums which then were taken to a waste area for processing in a ''jaw crusher'' before disposal in a radioactive waste burial site in Barnwell, North Carolina. The employees complained about the contamination and poor ventilation at the jaw crusher work station prior to the strike, but this equipment was not set apart in an enclosed area until some time after the work stoppage. After the small derbies were slagged they were packaged and shipped to Respondent's customers.

Large derbies were ejected from their pots in a slightly different manner: the retort was raised by a forklift and repeatedly dropped onto a steel plate in the floor until the derby and attendant slag were expelled into an attached container. Respondent's operations manual instructed employees to wait several minutes for the dust to settle from this breakout process before beginning to slag the derby.

An automatic air chisel was available for slagging the large derbies, but if it was in use, hand-held hammer and chisel would do. Employees were supposed to slag the derbies on a downdraft table. According to several witnesses, the table's air ducts had inadequate suction to draw off much of the dust generated during the slagging process. Here, too, employees often would slag one derby while sitting on another, a practice apparently tolerated by TNS supervisors, for several TDRH inspectors wrote that it seemed to be a common practice.

Slagging derbies evidently was one of the more hazardous undertakings in the plant for the TNS operations manual specified that employees were to wear respirators while performing this task. Since the strike, Respondent has modernized the derby slagging operation: the derbies are housed in booths fitted with portholes through which employees reach to slag with hand-powered tools.

5. Billet production

a. *Vacuum furnaces*

Prior to 1979, the derby was Respondent's end product. However, in the latter part of that year, TNS entered a new and expanded phase of its industrial life beginning the production of billets, also referred to as rods or ingots, approximately 2-1/2 feet by 6 inches, which ultimately were transformed into the GAU-8 penetrator core. In brief, billets were formed by melting the large derbies under intense heat in massive vacuum-pressured furnaces.

Initially, two 1200-pound derbies were placed within a container, referred to as a crucible. Top crop, composed principally of recycled scrap uranium, was loaded on top of the large derbies. The crucible then was sealed with three lids.

Because uranium is highly pyrophoric and will quickly oxidize when heated, derbies must be melted under vacuum to minimize such oxidation.[20] Consequently, Respondent installed a bay of two-storied vacuum furnaces for this purpose. The crucible was positioned in the upper level of the furnace. A mold tank which housed the mold assembly, a device with six cylindrically shaped arms to receive the melted uranium, was positioned on the ground level of the furnace directly below the crucible. At the outset of the melting process, the vacuum furnace operator inserted a stir rod into the crucibles (used to agitate the mixture) and turned on vacuum pumps. After a proper vacuum was obtained, the heating system functioned automatically, causing the uranium material to reach a molten state. At this point the operator punctured the seal at the bottom of the crucible with the stir rod, allowing the molten metal to pour into the mold assembly chambers to form billets. After 30 minutes, the metal froze and the operator introduced inert gas into the furnace to restore it to normal atmospheric pressure.

In practice, the vacuum furnaces did not function with the fine efficiency described in Respondent's operating manual. Instead, the vacuum furnace process contributed additional contamination to the plant. Even under normal circumstances, the vacuum process was imperfect since a residue of 3 to 4 gallons of oxide remained in the crucible after the molten metal had drained into the mold assembly. But circumstances were not invariably normal. If air was injected too rapidly or before the furnace had cooled sufficiently, the sight glass might be blasted out of its socket. Indeed, Respondent's operating manual anticipated such occurrences for it instructed the operator to stand aside while restoring the furnace to its normal state. If a sight glass or stir rod broke, the operator had to abort the vacuum melt process, reduce the heat and inject argon gas into the furnace in an effort to prevent an explosion. If the vacuum was broken and the stir rod withdrawn, tremendous heat and smoke laden with oxide particles, surged out of the stir rod opening, sometimes rising as high as the foundry ceiling. So much smoke was generated during such incidents that employees (other than the hapless furnace operator who had to remain on the job) were compelled to evacuate the building.

Generally, when the vacuum process proceeded uneventfully and the billets were formed, the mold assembly would be removed from the mold tank, leaving behind an inch and a half or so of oxide on the bottom of the furnace. The operators were responsible for cleaning the furnaces inside and out after each heat. Furnace operator Gary Reed testified that he shoveled the debris from the furnace into a 55-gallon drum encircled with a ventilatory collar. Even so, Reed stat-

[18] The two downdraft tables in the plant had open-grated surfaces to permit the slag to fall through to a tray below. The tables were ventilated by means of ducts connected to one of the Vokes dust collectors used in the foundry.

[19] Slagging refers to a procedure whereby employees used various implements to chip or scrape off the slag and uranium oxide which adhered to the derby's surface.

[20] At room temperature, finely divided uranium may ignite spontaneously in air, and even in water. See H. C. Hodge, J. N. Stannard, J. B. Hursh, eds., *Uranium, Plutonium, Transplutonic Elements* (1973) at 84.

ed that: ''The stuff would just blow up in my face.'' A vacuum hose used to clean the oxide and dust from the furnace surfaces, lacked sufficient suction to do the job. Reed reported this situation and maintenance employees attempted to cure the problem by changing the buckets within the dust collectors more frequently. However, when the suction problems persisted, Reed again spoke to a supervisor who simply instructed him to use the equipment as best he could.[21]

If the vacuum melt process had to be interrupted for any reason, the task of clearing the molten metal and black oxide ash from the bottom of the furnace became even more onerous. Although operators wore respirators while performing such tasks, they still were plagued with black nasal discharges. Reed's complaints about the ineffective ventilatory equipment which served the vacuum furnaces apparently were well-founded for in the summer of 1980, his supervisor advised him that he was ''overexposed.'' On another occasion, furnace operator, Mike Elam, was told that he, too, was overexposed.

Sally Hock, an inspector with TDRH prior to joining the TNS health and safety staff, reported in May 1980[22] that concentrations of airborne radioactive material in the furnace area were among the highest in the plant. When she asked TNS health and safety officer, Ron Barlow, whether he would conduct an intensive monitoring program in that area of the plant, he promised to turn to it next after surveying the billet breakout shop where he said dust posed an even greater problem.

Barlow may have intendned to correct the situation in the vacuum furnace area, but conditions did not improve until after the strike. Less than a year after the work stoppage commenced, TNS installed six new vacuum furnaces with 50-percent greater metal casting capacity than their predecessors had and with a ventilatory system redesigned to prevent release of contaminants to the work area. Moreover, an automatic system was installed to clean the furnace lids at the end of each vacuum heat cycle and metal shields were installed over the furnaces. When recalled to work in 1983, Reed observed, with good reason, that the vacuum furnace area appeared to be much cleaner than it was prior to the strike.

b. *Mold disassembly and crucible preparation*

The mold assemblies and crucibles were transferred from the furnace to an adjacent area of the shop for removal of the billets and cleaning of the equipment prior to reuse. As the molds and crucibles were shifted from one area to another they left a trail of oxide. This problem did not recur after the strike for Respondent's new vacuum furnaces contained a mechanism which cleaned the oxide from the crucibles prior to transfer.

At the mold disassembly area the mold sleeves were lifted leaving the billets exposed. Sprays of blackish dust which flew in all directions often were released during this process, covering the concrete floor with graphite and oxide dust.[23] The billets then were taken to a ''pickling tank'' where they were dipped in a nitric acid bath to cleanse them of any lingering oxides and slag.

Stripped of their contents, the various parts of the mold assembly and the crucibles were placed on downdraft tables. As the mold assembly was dismantled, the heavier pieces of dust, laden with oxidized uranium and pieces of slag, fell through the grated table top to a tray below. However, the smaller particles of dust and debris would evade capture and fly upwards. Wearing gloves for protection, the operators scoured the mold parts with steel wool and then painted them manually with brushes and sponges. Not until the latter part of January 1981 were the employees compelled to wear respirators while performing these chores. Later still, after the strike, Respondent began wrapping the mold assemblies in plastic sheets and placing them in enclosed metal containers before transferring them to the disassembly area.

Respondent experimented with several different methods of cleaning the crucibles and mold assemblies but Evelyn Rimel, one of the operators assigned to this task recalled, ''you never did have an efficient way to do it.'' The crucibles were supposed to cool outside the plant before they were cleaned. In fact, while still smoldering they often were stacked in open barrels next to the downdraft table. Rimel tried to find a cool crucible to work on, but often none was available. Then, under the practiced eye of her supervisor, she would find one which was less warm than others. Reaching far within the crucible's interior, she used a spent sawblade to first chip the slag which adhered to the crucible's inner surfaces and then scoured the interior with steel wool to remove whatever stubborn oxide remained. If the oxide was not completely cooled, the raking and scraping of the crucible's interior produced white hot sparks.[24] Moreover, during the vacuum melt process thorium (th-234), a radioactive daughter product in the uranium decay chain, floated to the top of the molten mass. Therefore, the residue entrained in the slag, on the interior surfaces of the crucible, on top of the mold assembly and on the upper ends of the cast billets was rich in th-234, a pernicious source of beta radiation, and posed a special hazard to the operators who worked in the disassembly area. Yet, prior to the strike, Respondent failed to monitor for beta activity here.

Rimel and her coworkers in the mold and crucible prep area were not required to wear respirators while they performed their tasks. Instead, Rimel testified that on her supervisor's advice, she simply averted her face and held her breath as the black oxide powder from the interior of the crucible roiled upward. In the winter of 1981 when airborne contamination in the billet breakout area exceeded the maximum permissible concentration (MPC) permitted by Federal and state regulations,[25] employees who performed a series of

[21] Reed's testimony was uncontroverted.

[22] Hock was employed by TNS in September 1980.

[23] The employees clearly distinguished graphite dust, which was shiny and metallic in appearance, from uranium oxide dust which they described as flat black in color. It must be borne in mind that the oxidized uranium metal was radioactive.

[24] Rimel impressed me as a particularly credible witness whose testimony was spontaneous and unrehearsed. Her keen recollection and powers of observation were demonstrated by her drawings of the crucibles, mold assemblies and vacuum furnace. These drawings are remarkably accurate considering that Rimel prepared them 3 years after ceasing work at TNS. (Compare G.C. Exh. 17 with R. Exh. 203, which are photographs of various pieces of equipment shown in Rimel's drawings.)

[25] Maximum permissible concentration or MPC is a term of art used in the administrative regulations to define the maximum

Continued

tasks in this part of the shop were compelled to wear respirators for virtually their entire shift. The problems with air quality at TNS are discussed infra at Part Two, IV,C,1.

Several employees testified that neither the downdraft tables nor the dust collectors to which they were connected provided adequate ventilation. In an effort to jolt the dust collectors into efficient performance, operators were instructed to turn off the collector when a gauge on an airflow filter affixed to it reached a certain point. This caused the collector to vibrate and shake the dust from its clogged, accordian-like filters into a bucket at the base of the unit. Rimel testified that she was told to turn off the dust collector whenever she went on a break. Although she diligently performed this shakedown task, she did not notice any appreciable difference in the position of a dial on the collector which should have registered an increase in air flow. Moreover, employees were not instructed to stop working on the downdraft tables during shakedowns while the dust collectors were not working at all.

Periodically, maintenance employees replaced the filters in the dust collectors after which the collectors functioned more efficiently. Within several weeks, however, the filters became clogged and air flow again was restricted. Within a comparatively short time, the air filters were reduced to their former ineffective condition.

Following the strike, alarms were affixed to the dust collectors and warning devices were installed on the air flow gauges which prevented them from operating when the air flow was constricted. Also, the Respondent vastly improved the crucible cleaning operations by enclosiong the breakout area and within it installing highly automated equipment including a carrousel in which the crucibles rotate in enclosed ventilated booths. In one booth, motorized brushes scour the crucibles. The crucible then rotates automatically to another booth where an operator paints the crucible with a spray gun rather than a hand-held brush. After drying, the crucible is transferred to an enclosed storage container. This pushbutton system stands in stark contrast to the primitive, hands on, brillo pad and spent saw blade techniques which employees utilized before the strike. Steven Prewett, who served briefly as Respondent's manager of health and safety after the strike, had good cause to boast to TDRH, ''it is anticipated that the new crucible cleaning operation . . . will prove to be a major improvement in health and safety over the existing operations.'' (G.C. Exh. 42f.)

The Lathe

The final steps in preparing the billets for shipment to an independent rolling mill involved two machining operations using a saw and lathe. Ricky Decker, the employee who bid successfully for this work, was trained by his predecessor on the job. Decker first sawed impurities from the billet reducing it to a specified length. He next removed surface blemishes from the billet and extracted a sample from it which was later tested by the quality control department. As he worked the saw and lathe, small pieces of slag and uranium slivers fell from the billet to a water filled pan below the machine. Often, these pieces ignited spontaneously and glowed red hot, releasing small furls of smoke. As often as twice a week, fires ignited at the lathe sending flames shooting one to two feet in the air. Several times in the months before the work stoppage, even more intense fires occurred. While dousing the flames, Decker never wore a respirator, nor did his supervisor suggest that he do so.

The Respondent implied that the lathe operator could have prevented fires by raking and submerging the oxides chips in the coolant solution stored in the pan below the equipment. However, given the highly pyrophoric quality of this swarf, the frequency with which such spontaneous fires ignited and the fact that Respondent kept lime on hand to douse the flames, it is reasonable to infer that the fires were not easily avoided and the operator was not as culpable as Respondent suggests. Moreover, although Respondent issued several written warnings to Decker for disregarding certain physical safety rules, none of them addressed his alleged unsafe handling of the lathe and saw. The Union requested that ventilation equipment be installed in the lathe and saw area but a hood was not placed over the equipment until April 1981. Even then, it was not connected before the strike.[26]

After the lathe and saw work was completed, 50 or 60 oxidizing billets were stored uncovered and unventilated in the derby shop for 2 to 3 days. They then were transferred to the warehouse to await shipment to an independent facility which extruded the billets into elongated bars.

B. *The Penetrator Shop*

Overview

The penetrator shop operators, housed in a building adjacent to the foundry, began working on the GAU-8-core in early 1980.[27] To produce the penetrator, the extruded rods first were shaped to an approximate diameter; cut to proper lengths; ground to an intermediate diameter; roughly tapered on one end; degreased, heat-treated and aged to a required hardness before being ground again to their final dimensions. These processes, described in greater detail below, exposed the operators to increasing doses of uranium contaminants so that within a year after operations commenced, any employee assigned to one of seven different penetrator work stations was compelled to wear a respirator for the entire shift. The degenerating working conditions in the penetrator shop was a great source of dissatisfaction to the operators there, who were among the most experienced members of the work force. Consequently, the penetrator shop operations played a major role in the evolving conflict with management.

1. The swager and shear

When the extruded rods were returned to Respondent as metallurgically stable bars, approximately 9 to 12 feet long and one-half inch in diameter, they were stored on open racks in an unsheltered area of the penetrator shop. From the storage racks, the bars were transported to the swager machine where they were heated to a more malleable state. Then, the operator ran the rods through the swager which straightened and sized them.

amount of airborne contamination which may exist in a controlled environment when averaged over a calendar quarter.

[26] Inspection reports of a joint union-management safety committee will be discussed infra at Part Two, VI,C of this decision.

[27] Senior employees who bid on these jobs were trained at another of Respondent's facilities in Compton, California. The trainees' experience in Compton will be discussed infra Part Two, VI,B.

Next, the rods were carted to the shear where they again were heated and then cut into 3-1/2 inch lengths referred to as blanks or slugs. Heating caused oxide to form on the rods so that as the cuts were made, smoke rose and minute oxide slivers fell to the floor. Occasionally, an oxide shaving ignited and released smoke. Ultimately, Respondent placed an adjustable hood over the swager to exhaust the smoke.[28] After the rods were cut, the blanks were spilled into 2,000-pound metal tote boxes. The abrasive action of metal falling on metal, triggered small clouds of oxide dust and sparks. These tote boxes were transferred by forklift to the next work station, the rough o.d. (outside diameter) grinders.

2. Rough o.d. grinders

A variety of grinding machines in the penetrator shop—the rough o.d. grinders, finish grinders, the nose and trim machine and face and chamfer—proved to be the greatest contributors to contamination in the penetrator shop.[29]

At the rough o.d. grinders, the parts were fed automatically through a vibrating bowl to a pair of parallel grinding wheels which honed the slug's exterior dimension to roughly the desired size. As the parts were agitated in the hopper, powdery uranium oxide on their surfaces was released and rose into the atmosphere. At the supervisor's direction, the grinder operators placed wet paper towels or water into the hoppers to reduce this dust, but some of this water, laden with oxide chips, dripped onto the floor. No ventilatory equipment was stationed directly over the vibrating bowls since this would have interfered with dumping the slugs into them. John Innello, an experienced electrician hired for maintenance work at TNS in early 1981, suggested that the vibrating bowls would excrete less dust if shocks were placed beneath them. However, neither the plant engineer, Joseph Romaine, nor Innello's immediate supervisor agreed with him. Yet, a consultant whom Respondent employed just after the strike began, recommended inserting rubber shocks beneath the vibrating bowls, just as Innello has suggested.

The grinding machines were encased in a metal housing to which protective rubber flaps originally were affixed. In order to adjust or ''dress'' the grinding wheels to correct tolerances, the operators had to set the rubber flaps aside. Often they removed the intrusive flaps altogether. As the slugs passed between the grinding wheels, copious amounts of a liquid coolant solution sprayed over them. This coolant, bearing minute metal particles captured during the grinding process, emptied into a sludge tank beneath the grinders and then was recycled to flow over the wheels again. Some of this solution escaped into the air as a fine mist. When the employees bent over the machine to dress their wheels or to remove jammed parts, they could not avoid coming into contact with the contaminated coolant spray which flew into their faces and dampened the front of their uniforms.

The sludge tanks beneath the grinders also presented problems. Frequently, they overflowed. Employee Brad Richardson testified credibly that the overflow made the floor surrounding the grinder so slick that the Respondent finally provided rubber mats to prevent the operators from slipping. Several laborers were supposed to clean the sludge tanks with hand- held shovels and remove the uranium particles on each shift. Since they also had a number of other tasks to perform, this particular housekeeping chore was not a top priority.[30]

By the spring of 1981, the penetrator shop operators realized that the contaminated mist which cooled the slugs in the grinders posed a health problem. Hoynacki agreed that the mist from the grinders contained uranium particles, but testified that he was unaware that the employees were being sprayed with these mists, even though he regularly received copies of the union-management safety reports which repeatedly identified the uncontrolled coolants streaming from the grinders as a matter of concern. TNS Vice President Christensen either was better informed or more astute than Hoynacki, for he confirmed the workers' suspicions about the grinder mist when he acknowledged to TDRH in a letter of June 17, 1981, that ''one promising theory'' (for the high exposures in the penetrator shop) ''is that the particulate is going into the air via the fine mist that escapes during the grinding.'' (G.C. Exh. 60ff.)[31]

3. Face and chamfer

From the rough o.d. grinders, the parts were transferred to the face and chamfer, a machine which functioned as a pair of lathes, cutting each end of the blanks to a precise angle. Like the lathe in the foundry, the face and chamfer cut metal bits from the blank which tended to ignite spontaneously if they were not totally submerged in the coolant solution stored in the receptable beneath the machine.

4. The degreaser and spray lube

In the next phase of the penetrator shop operations the blanks were separated from the chips or cuttings, dipped into a cooling agent known as a ''degreaser'' and sent to a ''spray lube,'' where the parts were heated and sprayed with another lubricant. Although the spray lube was completely enclosed, its doors generally were open to afford access to the operator who had to continually adjust one of four nozzles which controlled the spray. With no ventilation equipment at the spray lube doors, the fine black mist and smoke which belched forth, coated the floor and the operator. For this reason the employees familiarly referred to the spray lube as ''the locomotive.''

5. The forge

The properly sized blanks next were inserted into a forge where they were heated almost to a molten state and forced through a die in order to extrude a pointed nose on the part similar to that which appears on a conventional bullet. As the smoldering penetrators emerged from the forge they cooled and oxidized and then were transferred to the Sweco cleaner. At this machine, the penetrators were cleansed by immersing them in a vibrating bowl which pummeled the parts in water

[28] The record does not establish when Respondent installed this hood.

[29] Rough and finish o.d. grinding machines were identical and interchangeable, being set to different tolerances depending on their functions.

[30] The contents of the sludge pans was shipped to a burial site for radioactive waste.

[31] A consultant who inspected the facility shortly after the strike commenced also noted in a report prepared for the Respondent that coolant was escaping from a grinder. The RMC report (G.C. Exh. 10) is discussed in detail at Part Two, V,A.

and several hundred pounds of aluminum chips. Health and Safety committees members complained that the forge was not adequately ventilated even after Respondent added a roof vent over the machine in 1980.

6. The nose trim

On emerging from the forge the penetrator went to the nose trim machine where its nose was blunted. This machine, like the face and chamfer, often produced small chip fires which also released contaminants into the ambient atmosphere.

7. The heat treat furnace

In order to produce a specific degree of hardness, the parts next were submitted to the multi-chambered Ipsen vacuum furnace. First the penetrators were degreased, then heated. Next, they moved automatically to another chamber of the furnace where they were cooled in oil. Following these procedures, the parts again were heated in a separate ''aging'' furnace. Lastly, they were immersed and cooled in a water tank to reduce oxidation. However, no ventilation equipment was positioned at the furnace to capture the dust which arose when the parts were removed and dumped into a hopper.

Maintenance employees Rondale Garland and John Innello offered nightmarish descriptions of their experiences repairing the Ipsen furnace.[32] In order to avoid contact with the oil on the furnace floor, they formed a platform by sliding plywood planks across the base. After mending the furnace, they emerged with their uniforms filthy, their hair matted with grease, and oil clinging to their gloves, clothes, and shoes.

Innello worked on the aging furnace three or four times in a 5-month period preceding the strike. He did not have to enter this furnace, but he was required to insert his head within it. He found the baffles inside the furnace coated with dust. His tools became slippery from the oil and if one of them dropped, he was compelled to reach into the oil to retrieve it. After the strike commenced, Innello returned to the plant to claim his tools. However, they could not be released because they were so contaminated, and Respondent replaced them with new ones.

8. The finish grinders

The penetrators next were moved to the finish o.d. nose grinders where operators honed their diameters and nose tips to exact proportions. They were then cleaned and packaged for delivery to the U.S. Air Force.

The nine grinding machines in the penetrator shop performed in essentially the same manner and caused much the same problems. Because the 15 to 20 penetrator shop operators rotated jobs every 2 to 3 weeks, they each came into contact with the contaminants emitted by this equipment and in late January 1981, were required to wear respirators. In March 1981, a number of the penetrator shop operators who for over a month had worn respirators for their whole shift, staged a walkout. The protest ended quickly when their Union representative promised to address the problem in collective-bargaining negotiations. A month after this walkout occurred, with no end in sight to the mandated use of respirators and negotiations at a standstill, the plight of the penetrator shop employees was an influential factor in the decision to strike.

C. *The Employees' Physical Appearance*

As TNS' operations expanded after the Aerojet acquisition, so too did the size of the work force. Between 1978 and 1981, the number of TNS employees more than trippled. A composite profile of the TNS production and maintenance personnel just before the strike would show that they were generally young; over 70 percent were under 30 years of age. Respondent did not require a high school diploma for employment and indeed, no rank-and-file employee had more than a 12th-grade education; several were illiterate and one was brain damaged. Many were holding their first full-time job and none ever worked at a facility which used a hazardous material. While no comment or slight is intended to the employees' native intelligence or candor, it is necessary to point out, and the record transcript confirms, that in general, they were not articulate or polished speakers.

In the same inartful terms they used to detail the grim conditions in the plant, the employees also described their grimy physical appearance at the end of a workday. Their accounts, which were presented in an unrehearsed manner, were too consistent to be disbelieved.[33] If any lingering doubt remains as to the truth of the employees' testimony regarding their physical appearance, it was put to rest when Plant Engineer Romaine acknowledged that at the end of the workday, the foundry employees looked like coal miners.[34]

Foundry workers testified that although they washed before each break, by the end of the shift, their faces and other exposed portions of their bodies were black from the dust, soot, and smoke. Many complained of discharging black mucous when they sneezed or blew their noses, a condition which abated somewhat over the weekend. Operator Gary Reed testified that the black soot would make his hair stiff as brillo; he wore plugs to prevent dirt from entering his ears. Another employee kept a toothbrush at his work station to remove dusty particles which lodged in his teeth; Rimel scrubbed her skin with a buffing pad at the end of the day to remove the black specks from her pores. When she asked Jim Barlow, the TNS resident health and safety officer, if tests could not be performed to sample the black material which invaded the workers' nostrils, he told her that such a test would be too costly. Uniforms which were fresh in the morning, were a dingy black at the end of the day; the black dust also penetrated outer clothing to soil underclothes and socks.

By 1981, conditions in the penetrator shop were different but no better than those in the foundry. Innello stated that with the shop door opened, he could see dust motes suspended in the air. Of course, he could not see the invisible

[32] I agree with the arbitrator who wrote that Garland ''struck me as an expecially careful and truthful witness.'' See 76 LA 284 (1981). Innello, a mature individual who worked as a licensed electrician since 1947 or 1948, also impressed me as a particularly reliable witness.

[33] The General Counsel stated that, in most instances, his first and only opportunity to interview employees came on the evening just before the day they testified.

[34] Respondent's witness, Jean Smith asserted that she found the plant a clean place in which to work. In light of overwhelming, credible evidence to the contrary, Smith's testimony must be discounted.

concentrations of alpha particles which emanated from the airborne contaminants. Penetrator shop operators explained that the dust was produced when thousands of uranium metal slugs were emptied into the unventilated vibrating bowls of the of the grinding machines. Smoke from the Ipsen furnace and the forge also contributed to a hazy and contaminated atmosphere. The coolant mists bearing uranium metal specks which sprayed the operators' faces and clothing made matters worse.

The employees believed that excessive contamination in the plant was causing a variety of ailments. For example, Innello and Garland testified about recurrent nosebleeds, lower back pain and difficulty in urinating, a condition associated with kidney disfunction.[35] Innello believed that the period of time he was notified of high results on his urinalysis coincided with his venture inside the Ipsen furnace. When employees mentioned their lower back pain to RSO Barlow, he agreed that they probably were kidney-related problems and prescribed drinking beer as an antidote.

Ricky Decker complained of feeling tired and suffering headaches for which his doctor prescribed kidney pills. His sister, a medical technologist, performed a laboratory test which detected a heavy metal deposit in his blood.[36]

D. *The Change Room*

The employees neither arrived nor left the plant coated with the dust, soot or grime which covered them during their working hours. At the beginning of each shift, employees changed from their street clothes to work clothes—fresh coveralls, safety boots, safety glasses, and perhaps gloves, which Respondent provided. At the end of the day, the process was reversed. Employees were required to shower and to change clothes in locker or change rooms. Change room procedures were prescribed not simply for cleanliness sake but as a means of decontaminating exposed personnel and confining contamination to controlled areas of the plant.[37] Credible evidence suggests that the TNS change room did not fulfill its hygienic purpose.

Approximately 30 feet wide by 50 feet long, the change room was divided (theoretically) into clean and controlled zones by a yellow and magenta striped tape masked to the floor and by a row of shower stalls, one of which gave access to both the controlled and uncontrolled side of the room. Each employee was assigned a locker on each side of the change room; one for their street clothes the other for work clothes.

A description of the change room at breaktime illustrates some of its deficiencies. The operators entered the change room at the start of their breaks. They removed their coveralls and safety boots and stuffed them into half lockers or left them on benches on the dirty side. They then crossed to the clean side to don their own clothing. At the end of the day, the employees were required to shower before changing and leaving the plant. Their dirty coveralls were left in a barrel to be collected and washed in an on-site laundry. When the uniforms, originally white in color, were returned, they had a dingy grey cast. As Respondent acknowledged, neither the dirt nor the contamination ever was completely removed.[38]

Although a nuclear facility may use tape to mark off the controlled from uncontrolled areas, such markings do not necessarily establish that the area on the uncontrolled side is free of contamination. The TNS employees clearly found both sides of the change room equally dirty. There were no real barriers to contain the tracked-in dirt and dust which drifted from one side of the room to the other; the space was too small and crowded to accommodate orderly change within the time alloted; and contaminants also were delivered from the dirty to the clean side by supervisors who walked about without removing protective covers on their shoes. Two employees charged with mopping the change room daily, could not keep pace or control the dirty conditions caused by the constant flow of traffic through that area. Moreover, no cleanup crew was assigned to clean the change room during the night shift.

The employees' suspicions about the change room conditions were confirmed when they overheard a health and safety technician conclude that both sides of the room were equally contaminated. A TDRH report also detected excessive levels of contamination in both the change room and restroom. In an August 1980 letter to Respondent, TDRH noted what the employees already had observed that plant personnel were wearing contaminated protective shoe covers into uncontrolled areas. Respondent's own surveys recorded high radiation levels in the uncontrolled zone, proving that the change room was not fulfilling its function of confining contamination within operating areas of the plant. Despite repeated Union complaints about the change room, the Respondent failed to correct the problem until after the strike.

In conformance with Government regulations, vehicles packed with radioactive waste were not released from the TNS compound until they were steam cleaned and surveyed with a geiger counter to assure sufficient decontamination. TNS employees left the plant without similar assurance. A number of operators who trained at Respondent's California plant recalled seeing a personnel geiger counter in the change room there which employees used to check themselves for lingering contamination before they left the plant. A TDRH letter suggested that Respondent provide such a device. In fact, TNS acquired a personnel meter in March 1981 but failed to install it prior to the strike.

Employees took their own work-soiled contaminated underclothes, socks, towels, and hats with them, but they were not given special instructions or warnings about laundering these articles at home. Over time, some employees became

[35] On cross-examination, Garland acknowledged that as a condition of his reinstatement at TNS, in 1983, he completed a medical questionnaire on which he indicated he never had sustained a back injury. Garland explained he assumed back injury referred to a blow of some sort or an externally caused physical wound but not to pain stemming from a kidney disorder.

[36] Decker's ailment will be discussed further at Part Two, V, E.

[37] A controlled area of the plant refers to a ''radiation area'' which is defined by TDRH regulations as an area ''accessible to individuals in which there exists radiation at such levels that an individual could receive a dose to the whole body in excess of 5 millirems in any 1 hour or 100 millirems in any 5 consecutive days.'' (G.C. Exh. 11 at 4.)

[38] Most of the testimony concerned the male employees' change room. The women employees, approximately 5 in number, had a separate lockerroom which also was divided by a tape into a clean and dirty side. Evelyn Rimel's description of the women's lockerroom indicated that conditions there were not much more favorable than in the men's change room.

concerned about mingling their garments with the family wash. Innello, for one, threw out her husband's blackened socks. Another employee watched with dismay as he shook his cap and observed sparks fly out. Despite repeated union complaints about the change room, Respondent failed to improve it until after the strike. In 1983, a completely new locker room was constructed with a wall partitioning the clean from the contaminated side and with full lockers on both sides. An outside contractor now provides janitorial services on all shifts. Further, Respondent began providing and laundering work hose for its poststrike labor force.

IV. RESPONDENT'S HEALTH PROTECTION PROGRAM

A. *Scientific Background*

Pursuant to Federal and state laws, TNS was required to have in effect, and abide by, a comprehensive health program which complied with regulatory standards designed to protect employees from harmful exposure to radioactive and chemically toxic substances. As a prelude to assessing health conditions at TNS, the next section of this Decision first sets forth in summary fashion germane scientific background information, followed by a review of the regulatory apparatus and standards applicable to Respondent.

1. The *Allen v. U.S.* decision

In *Gateway Coal Co. v. Mine Workers*, 414 U.S. 368 (1974), the Supreme Court decided that the protections of Section 502 of the Act may be invoked only if the presence of abnormally dangerous conditions are established by ''ascertainable, objective evidence.'' Id. at 387. Pursuant to this test, the parties presented expert scientific testimony together with complex, technical documents. To evaluate this evidence, a grasp of some basic principles of nuclear phsyics and the biologic effects of radiation is necessary. To facilitate this educational process, I suggested to the parties at the hearing that specific portions of a then recently issued decision, *Allen v. U.S.*, 588 F.Supp. 247 (D. Utah, 1984), appeared to be relevant to the claims and counterclaims regarding radiation exposure in the instant case, and therefore, might well serve as a reliable exposition of scientific background material.[39]

The parties were invited to submit statements of position regarding the propriety of the proposed reliance on *Allen.* With certain minor reservations, the General Counsel and the Charging Party agreed that the designated portions of *Allen* could serve as a source of general background information.[40]

The Respondent opposed any reference to *Allen*, principally because the district court judge relied on the scientific expertise of Drs. Karl Morgan, and John Gofman whose testimony the judge in another case, *Johnston v. U.S.*, 597 F.Supp. 374 (D. Kans. 1984), had discounted; and also because the Allen court accepted the theory that there is no safe threshold level below which exposure to radiation will not result in an increasing incidence of cancer.[41]

In *Allen*, 1200 plaintiffs sued the Government under the Federal Tort Claims Act alleging that open air atomic weapons test programs conducted in the late 1940s and 1950s negligently exposed them to low levels of radioactive fallout, producing injury and death. Of the 24 ''bellweather'' claims (i.e. those for which a decision might provide a legal and factual pattern for the remaining cases) which were tried initially, judgment was entered in favor of 10 of the plaintiffs. In *Johnston*, supra, the plaintiffs failed to establish that their cancers were caused by exposure to very low levels of ionizing radiation which emanated from radium-treated dials and instrument parts provided by the government to their employer, an aircraft instrument and development plant. District Court Judge Kelley, criticized Doctors Morgan and Gofman's methods and questioned their motives using harsh language to register his displeasure. A review of Judge Kelly's decision reveals however, that he focused principally on the statistical calculations which led the doctors to conclude that there was a very high probability that the plaintiffs' injuries resulted from very low-level exposures in their workplace. Judge Kelley rejected these experts' testimony in major part because in his opinion ''they both used unreliable statistical methods which are not those commonly used by this field of science. Kansas law requires that causation must be proved to a reasonable degree of medical certainty.'' *Johnston v. U.S.*, supra at 412.

The portions of the *Allen* decision on which I intend to rely do not deal at all with statistical assessment of individual injury; rather, they address broad scientific principles which represent the considered consensus of the scientific establishment. Further, while in *Allen*, Judge Jenkins cited articles and treatises authored by Doctors Morgan and Gofman, he also relied upon a vast array of other esteemed scholarly works to support the introductory sections of his decision.[42]

The *Allen* and *Johnston* courts do differ on a question of fundamental importance; that is, whether a threshold radiation dose exists below which no harm will occur. On the one hand, in *Allen*, Judge Jenkins accepts

> the overwhelming weight of currently available scientific evidence which supports the view that at any exposure level, ionizing radiation causes some degree of biological damage and creates some long-term risk of cancer and leukemia in those persons who are exposed. . . . While there remains considerable uncertainty—and

[39] Reversed on grounds unrelated to the scientific discussion in the district court's decision. See *Allen v. U.S.*, 822 F.2d 1094 (8th Cir. 1987).

[40] The General Counsel pointed out that the Allen decision did not discuss the nephrotoxicity of uranium products; the Charging Party cautioned that Allen was not especially concerned with internal alpha emitters, the prime source of radiation exposure at TNS, and did not focus on the particular properties of greensalt and uranium oxides or the effects that those compounds might have on human tissue, matters which are of particular concern in the instant case. While counsel are correct in pointing out these limitations, they do not detract from the general reliability of the particular sections upon which I propose to rely.

[41] Respondent also objects to some of the *Allen* court's rhetoric. Since Respondent merely quibbles with Judge Jenkin's graphic judicial prose, I do not find this objection worthy of comment.

[42] In *Johnston*, Judge Kelly case was critical of Dr. Morgan for serving as a ''professional witness'' in the service of a cause. It would be naive to expect absolute objectivity from the adversaries' experts. The testimony and credibility of the experts must be evaluated independently in each case. Dr. Auxier, one of Respondent's chief expert witnesses, like Dr. Morgan, has testified in a number of cases dealing with radiation dangers. I do not assume that this fact undermines the credibility of either witness.

> controversy—surrounding the precise quantitative mathematical description of the dose response relationship . . . none of the recent studies offer any direct evidentiary support for a threshold dose below which exposure is ''safe,'' harmless and without additional risk. *Id.* at 419.

After reviewing a multitude of scientific sources, Judge Jenkins concluded:

> that a reasonable person, exercising great care in light of the best of available scientific knowledge, would err on the side of caution by assuming no ''safe'' threshold exposure to atomic radiation, i.e., that any degree of exposure equates with some corollary degree of biologic risk and by determining that every practicable step be taken to minimize unnecessary radiation exposure. The reasonable man would not, therefore, conclude if radiation dosage is kept at or near the ''maximum permissible'' limits . . . there is no increased risk of injury. *Id.* at 362.

The *Johnston* court on the other hand, was skeptical of the no-threshold doctrine, calling it an unproved speculative hypothesis. Thus, Judge Kelly wrote ''There probably is, at least, a safe or practical threshold from exposure of about five rems per year, as a maximum permissible low dose.'' Id. at 47. He further stated that while certain scientists assume there is no threshold, such understanding was in his view ''contrary to standard toxicological science which assumes that there is a threshold for all harmful chemicals.'' Id.

By the late 1940s and early 1950s, most reputable scientists and eminent scientific institutions concerned with radioactivity subscribed to the theory that there is no threshold level of exposure below which no risk to low levels of ionizing radiation occurs. A corollary concept, espoused by most experts, is that the degree of risk to low level exposure is in direct linear proportion to the degree of risk from high exposure. The *Johnston* court's rejection of the no-threshold, linear concepts is plainly at odds with the views held by the most respected national and international experts in the radiation field. I am ill-equipped to question judgments which have been long endorsed by the most prestigious elements of the scientific community and therefore, refrain from doing so.

It is important to note that both *Allen* and *Johnston* were tort claim cases and, thus, were concerned inter alia, with the question of causation; that is, whether the defendant's acts or omissions were the proximate cause of the plaintiffs' injuries. The instant case is not controlled by tort law. At issue here is whether Section 502 of the Act protects employees who ceased work allegedly to evade abnormal hazards caused by excessive exposure to DU. Thus, although the General Counsel must prove that the employees had a reasonably grounded fear that abnormal dangers actually existed, he need not prove injury in fact, or establish Respondent's liability for such injury. Given the scientific community's widespread acceptance of the no-threshold-linear theory and in light of the protective, beneficent purposes of Section 502, I concur with Judge Jenkins that ''a reasonable person exercising great care in light of the best of available scientific knowledge would err on the side of caution by assuming no 'safe' threshold exposure to atomic radiation.'' *Allen*, supra at 362.

In sum, I am persuaded that reservations expressed by the Court in *U.S. v. Johnston* do not negate the validity or usefulness of the introductory material in *Allen.* Buttressing this view, I note that although the Government appealed the judgment in favor of the 10 successful *Allen* plaintiffs, it did not challenge the District Court's statement of scientific principles upon which I rely. Given Judge Jenkins' lucid synthesis of complex, scientific matters, I see no need to rewrite what he already has so ably presented. However, for convenience sake, a brief summary of germane, scientific concepts extracted primarily from *Allen v. U.S.*, follows.[43]

2. Summary of radiation concepts

a. *Background radiation*

Radiation originating from natural sources is ubiquitous; it bathes everyone throughout a lifetime. This low-level ''background'' radiation emanates from the cosmos, from materials in the earth's crust (such as uranium) and from substances within all living things. Typically, with variations dependent on altitude, Americans receive doses[44] of approximately 80 millirems annually[45] from background radiation. The discussion of low-level ionizing radiation at TNS is in reference to exposure in excess of that unavoidably received as background radiation.

b. *The anatomy of the atom*

Uranium, 1 of 92 naturally occurring elements, like all other matter, is composed of an arrangement of atoms. Structured like a minute solar system, the atom possesses a central core or nucleus which contains a specific number of protons and neutrons surrounded by orbiting electrons. As long as the number of protons remains the same, the element retains its identity, although the number of neutrons may vary to form different isotopes of that element. Ninety-nine percent of the atoms in natural uranium have 92 protons and 146 neutrons. Hence, natural uranium is designated U-238, the sum of the

---

[43] The following portions of the *Allen* decision, upon which my summary is based, are incorporated by reference into this decision: 260–280; 297–301; 311–328; 358–362; 416–425.

[44] Dose, defined in the Regulations of the U.S. Nuclear Regulatory Commission (NRC), 20 CFR 20.4, ''is the quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body.''

[45] *Scientific American*, Vol. 246, Feb. 1982, No. 2. A. Upton, ''Biologic Effects of Low Level Ionizing Radiation'' at 41. Ionizing radiation is measured in a host of ways, but the terms most commonly used in this proceeding are rads and rems. The rad (radiation absorbed dose), expresses in gross terms the amount of energy delivered by ionizing radiation to living matter; that is, 1 rad equals 100 ergs per gram of tissue. The term rem (roentgen equivalent man) was coined so that the greater biologic impact of some forms of radiation could be compared with those of less severity. Thus, a rem is the radiation dose to human tissue measured in rads, and multiplied by an appropriate quality (Q) factor. For example, 1 rad of beta or gamma radiation equals 1 rem. However, since the high-LET alpha particle is signficantly more damaging to the body, 1 alpha rad equals 20 rems (see also *Allen v. U.S.*, supra at 311–316. Doses less than 1 rad or 1 rem are measured in fractional form as 1 millirad, written as .001 or 10-3, 1 millirem is .001.

protons and neutrons in each of its atoms.[46] Atoms of different elements may join together to form compounds, the smallest unit of which is called a molecule.

c. *Radioactive decay*

In the heavier natural elements, uranium being the heaviest, the disproportion in the ratio of nuclear neutrons to protons causes instability. In conformance with an ineluctable rule of nature, this imbalance is corrected by a process of radioactive decay; that is, the atom's nucleus degenerates or decays spontaneously by discharging (or radiating) subatomic particles. These particles are of three types: alpha, beta, and gamma. Natural and depleted uranium decays by emitting the particularly potent alpha particle. Theory holds that this decay occurs at a constant rate which is expressed statistically as the half life of a radionuclide. U-238 has an extraordinarily long half-life of 4.5 million years, which means that after that length of time, 50 percent of any given amount of U-238 will remain in its same isotopic form.[47] The balance decays into various radioactive ''daughter products,'' until it reaches a stable end product, lead.[48] The longer a radionuclide's half life, the more persistent and pernicious is the hazard it represents.

d. *Properties of the alpha particle*

DU does not present an external radiation hazard to the biologic well-being of an exposed individual since it chiefly emits alpha radiation at an energy level too low to penetrate the skin's outer layers. However, as a result of contamination, if alpha particles become airborne and are inhaled or ingested, they may menace human health. When the alpha particle penetrates tissue, it transmits energy indiscriminately through a series of random collisions with the atoms and molecules in the region through which the radiation passes. The alpha particle wrenches electrons from orbits of the atoms in the matter traversed, leaving in their wake charged atoms called ions. As these particles continue on their rampage, they may cause grave biologic damage.

The amount of energy transferred by the alpha particle per unit of distance traveled is known as linear energy transfer, or simply, LET. Alpha radiation is considered high-LET because in comparison to the low-LET beta particle, it delivers a great deal of energy within a very short distance, intensely irradiating cells and molecules in its path until the radioactive material either decays or is excreted. Thus, internally, high-LET alpha particles are far more hazardous than either beta or gamma radiation. Consequently, alpha particles are assigned a relative quality factor of 20; that is, each rad of alpha radiation equals 20 rems because it is 20 times more effective in its ability to damage human tissue than is a beta or gamma rad.

e. *The biologic effects of ionizing radiation*

As eloquently described in *Allen*, supra at 115: ''At the core of each living cell is a nucleus containing the thread-like chromosomes, which carry genes. Genes, in turn, house the DNA molocules . . . which carry encoded within their delicate patterns the entire genetic blueprint controlling the structure, composition and chemical activities of each cell.'' The harmful effect of low level radiation to the human body is a result of energy transfers which disrupt the molecular structure within the individual cell or cells. When the affected molecules are essential to the cell's normal functioning, the cell may suffer injury or die.

Under most circumstances, the risk of serious, delayed effects from low level ionizing radiation is small. However, the damage produced by repeated doses of radiation is cumulative and the likelihood of repair for injury caused by alpha particles is diminished. Therefore, ions created by the intrusive alpha particle may wreak havoc in the DNA molecules that make up the human genes and determine genetic traits.[49] If the ion destroys the cell's normal ability to control its own reproduction, thereby causing it to multiply too rapidly, cancer and leukemia may result.[50] If alpha particles pass through the ovaries or testes, a minute fraction of the ions could damage the reproductive genes and cause mutations in subsequent generations.

A great deal of knowledge and experience is available with regard to the biologic effects of radiation on human tissue where the dose is above 50 rems and is delivered rapidly. Studies of the survivors of the atom bomb blasts in Nagasaki and Hiroshima revealed that the victims manifested a significantly greater incidence of leukemia and various forms of cancer than would have been anticipated in a similar group of persons who were not so exposed. However, it is low level, not acute radiation exposures, which are at issue here.

Low-level radiation effects on human populations exposed to less than 50 rems are far more difficult to demonstrate and quantify for a number of reasons. First, such exposures produce no immediately visible symptoms. Second, the difficulty of estimating the increased risk of exposure to low doses is complicated by a latency period which ranges from 5 years for leukemia to 30 or more years between exposure and the detectable incidence of cancer. Moreover, once malignant cells are detected, there is no way to identify the exact cause of the cancer from a number of earlier probable insults to the body. Consequently, a causal relationship between low level radiation and cancer is inferred from epidemiological evidence. This simply means that ''a population exposed to a certain dose of radiation will show a greater incidence of cancer than the same population would have shown in the absence of the added radiation.'' *Allen v. U.S.*,

[46] In addition to U-238, natural uranium is composed of two other isotopes: U-234 (.006 percent) and U-235 (.7 percent). Depleted uranium differs from natural uranium in that it has only .2 percent U-235.

[47] Radioactive half life must be distinguished from biologic half life which refers to the length of time for one-half of a radionuclide absorbed in material to be expelled from the body. Biologic half-life depends in part upon the transportability of the radionuclide within the body.

[48] The radioactive decay chain for U-238 appears in G.C. Exh. 30 at 22.

[49] Some scientists theorize that a change in one DNA unit among the several thousand that make up the gene can be enough to help start the process that results in malignancy. See J. W. Gofman, *Radiation and Human Health* at 571 (1981).

[50] Ionizing radiation may cause any form of cancer or leukemia except for chronic lymphatic leukemia and a few solid tumors such as cancer of the prostate. *Allen v. U.S.*, supra at 322.

supra at 322 quoting Radiation and Human Health at 54-55.[51]

The *Allen* decision's vivid discussion of risk from exposure to low-level radiation doses warrants quotation:

> [R]adiation injuries to genes and chromosomes appear to be cumulative, except to the limited extent that they are correctly repaired by processes within the cell. While the extent of radiation injury to cells inflicted at ''high'' dose rates may perceptibly affect the functioning of the organism more dramatically than a series of ''low'' doses imparted to cells over a period of time, injury may nevertheless result. At the level of the individual cell, ionization is ionization, and a linear energy transfer is a linear energy transfer. . . . If a single alpha particle does carcinogenic damage to the genetic machinery of the cell, it may be irrelevant whether additional particles crash through the cell chemistry or not. Indeed, the 1980 report of the BEIR-III Committee . . . observes that ''there appear to be mechanisms . . . pertaining especially to exposure to high-LET radiation, that increase the observed effect per unit dose when the dose rate is reduced.'' . . . The failure of the human epidemiological studies to persuasively identify a ''threshold'' dose below which the risk of cancer is not at all increased lends additional support to the view that even at low doses, critical biologic injuries accumulate. *Allen*, supra at 326.

Because of the uncertainties created by the lack of immediate, demonstrable proof of effects from low level ionizing radiation, the scientific establishment has derived risk estimates by assuming that a linear relationship exists between dose and response; that is, the damage caused per rem of radiation is assumed to be the same at low doses as at high doses.[52] Recent studies of Japanese atomic bomb survivors lend added support for the linear relationship where high-LET radiation (such as alpha particles) are concerned. See *Allen*, supra at 424–425.

Recommended dose limits for occupationally exposed workers and the public are based on the assumption of a linear relationship between radiation dose and the extent of risk. Thus, an individual who receives a dose below a regulatory ceiling does not necessarily escape bodily harm. Rather, administrative standards reflect a public policy determination that doses below the ceilings constitute an ''acceptable'' risk—in the sense that a worker who knowingly takes a job which exposes him to radiation has accepted the risks which attend exposures below the regulatory limits.

3. Chemically toxic effects of uranium

The biologic hazards of uranium do not stem solely from its radioactive properties. In addition to its carcinogenic potential, DU poses an additional, and perhaps greater, threat to health as a heavy metal capable of chemically poisoning the kidneys. The kidneys are critical to the body's vital functions: they serve to filter out acidic materials in the form of urea, and conserve other necessary products which they usher back into the bloodstream.

The effects of uranium poison, like those of radiation, may be acute or chronic. In an acute form, large but sublethal doses of uranium may produce transient injury from which the kidney recovers in fairly short order. However, prolonged exposure to low level concentrations of uranium compounds presents a clinical picture different from that of acute poisoning. The effects of repeated small doses will not be immediately evident; 2 to 4 years may elapse before sensitive tests can detect incipient renal damage. Moreover, scientists warn that the kidneys do not necessarily repair themselves when low level doses are sustained over an extended period of time; for example, when uranium workers receive chronic exposures.[53] Serious damage to the kidneys may be caused by protracted exposure to soluble uranium compounds. Although the depleted uranium at TNS was considered either relatively or highly insoluble,[54] even the most insoluble uranium compounds have some soluble components or may be partially converted into more soluble form by the natural operation of the tissue fluids.[55]

---

[51] Epidemiology is the only generally accepted scientific discipline which integrates statistics and biological medical science to identify and establish the causes of latent human disease and predict its future occurrence. The epidemiologist detects human health risks at particular levels through studies which compare two populations: a group or cohort which has been exposed to appreciably high levels of the suspected health hazard under examination; and a control group representative of the general population. These populations are followed for a length of time. The more extended the period of study, the better; conversely, the briefer the period under study, the less reliable are the results. With diseases such as cancer, which have an extended latency period, the followup ideally should be for as much as 30 to 50 years. If the two groups are otherwise comparable, then any difference in the incidence of disease in the cohort can be related to the hazard under study. If there is no increased incidence, then relative risk is stated as 1:0; that is, the incidence of the disease for the cohort and control group were identical. If there is an increased incidence of the disease in the cohort, it is stated, for example, as 1:1.49 which would represent a 49 percent excess incidence of the disease in the cohort. The greater the incidence of the disease in the exposed group, the stronger the causal association between the toxic factor and the disease. In order for the relationship to be considered ''statistically significant,'' the incidence figure must have a 95 percent confidence factor. This means that there must be a 1 in 20 chance that the outcome was not coincidental. Thus, epidemiology studies predict the probability of disease in populations; it does not predict or diagnose disease or injury in a given individual.See J. Mausner and A. Bahn, *Epidemiology: An Introductory Text*, 312–313, 322–325 (1974).

[52] In 1954, the linear hypothesis was formally adopted by the International Commission on Radiologic Protection (ICRP), and the National Commission on Radiologic Protection (NRCP), and in 1971, by the NRC. Minority segments of the scientific community subscribe to two other dose-response conjectures: (1) the linear quadratic hypothesis, which assumes that radiation risks per rem are less at low doses than at high, particularly where low-LET radiation is involved; and (2) the supralinear hypothesis, which submits that low level radiation leads to a greater incidence of cancer at low levels than would occur by application of the linear or linear-quadratic theory. Most scientists accept the linear theory where higher doses are involved.

[53] *Uranium Plutonium, Transplutonic Elements*, Chapter 4 at 213.

[54] Disagreement among experts as to the specific solubility classification for the compounds at TNS will be discussed at Part Two, V,B, C, and D.

[55] In a study of uranium effects on workers at Cotter Mill in Colorado, to be discussed infra at Part Two, V,F, the National Institute of Occupational Safety and Health (NIOSH) commented that ''ura-

Continued

After intake, soluble uranium particles enter the bloodstream and are transported swiftly to the kidneys. There, within the cortex, or outer covering of the kidneys, are millions of tiny ball-shaped capillaries called glomeruli. Each glomerulus catches acids in the form of urea which drain through tubules (tubes) to a central sack and then into the bladder. The tubules also are needed to introduce purified water into the bloodstream. A great part of the uranium ions which are carried to the glomeruli are excreted in the urine, but some of these ions attach to protein in the cells which line the membrane of the tubules. This chemical attachment may destroy those cells, causing them to slough away from the tubule lining. Gradually, these dead cells accumulate and block the tubules, preventing them from properly cleansing the blood. Over time, the kidneys may manifest changes in urinary output and blood levels—the symptoms of chronic nephritis and renal failure. Ultimately, the kidneys may atrophy and cease functioning altogether. Removal of the kidney or dialysis are intermediate remedial devices; total renal dysfunction can lead to death.

In light of the chemically toxic hazard posed by DU, the Respondent collected bimonthly urine specimens from its employees. These samples were submitted to an independent company for analysis of the uranium content, measured as micrograms of uranium per liter of urine (ug/l). The employees' urine bioassay data (compiled in G.C. Exh. 4), the diverse standards available to assess risk from uranium-in-urine content, and scientific opinion as to the significance of the TNS urinalysis data are discussed further below in IV, B,3 and V of this part.

B. *Radiation Protection Standards*

Evaluating the health risks faced by the TNS workers requires some familiarity with the standards set by regulatory bodies to protect workers from excessive exposures.

1. The standard setting bodies

The NRC (formerly the Atomic Energy Commission) had its genesis in the Atomic Energy Act of 1946, as amended in 1954, when Congress determined that private enterprise could share in the development of nuclear products for civilian and military purposes as long as the health and safety of the public and workers in the industry were not endangered.[56] (10 CFR 20.101.) The Act created the Atomic Energy Commission which was charged with setting standards for levels of permissible exposures for workers and the public and regulating the nascent nuclear industry to assure compliance with its standards. These functions were ceded to the NRC under the Energy Reorganization Act of 1974. (42 U.S.C. 5801.)[57]

In carrying out its statutory mandate, the NRC promulgated standards for radiation exposure which generally tracked the recommendations of two esteemed nongovernmental bodies: the International Commission on Radiologic Protection (ICRP) which, as its name implies, is a multinational group of distinguished radiation experts, and the National Commission on Radiologic Protection, the ICRP's counterpart in this country. These organizations work together to analyze epidemiologic research on radiation effects and issue reports setting forth, inter alia, recommended exposure levels and mathematical models to calculate doses delivered to the body and its organs.

Based on post-World War II studies, both the ICRP and the NCRP revised the earlier, more lenient radiation exposure standards, suggesting that the previous permissible doses should be reduced by a factor of 2.[58]

Since 1957 when the ICRP's and NCRP's revised exposure recommendations were adopted, the NRC has made no changes in its regulatory standards. The NRC standards, setting maximum doses for workers are as follows: the dose to the whole body shall not exceed 1 and 1/4 rems per calendar quarter and no more than 5 rems annually.[59] (10 CFR 20.101.) On rare occasions the quarterly limit may be exceeded so long as the exposure does not exceed 3 rems in any quarter or more than 5 rems per year.

Based on an ICRP recommendation, the NRC standards were amended in 1971 to include the additional requirement that licensees make every effort to maintain radiation releases ''as low as reasonably achievable.'' This important doctrine, commonly known by its acronym, ALARA, is rooted in the no-threshold theory that no dose of radiation is so low that it may be assumed to be safe or risk-free. See 10 CFR 20.1 (c). The NRC has not set numerical criteria which must be met to comply with ALARA. It has suggested, however, that expending $1000 per rem to the public and $3000 to $15,000 per rem to the worker to reduce radiation exposure evidences reasonable compliance with the ALARA obligation. (See 40 Fed. Reg. 1439, 19440 (1975).)

2. Chemical toxicity standards

The NRC publishes regulatory guides which, while not binding as law, reflect the Commission's view of the proper interpretation of its regulations and provide guidance to licensees in complying with regulatory standards. Regulatory Guide 8.22, Bioassay at Uranium Mills (Reg Guide 8.22), published for comment in 1978 but not formally adopted then, has particular significance in this case. It set proposed limits on acceptable levels of uranium in urine to protect against chemical toxicity to the kidney. In brief, Reg. Guide 8.22 stated that kidney damage may occur if any single urine specimen was greater than 130 micrograms per liter (ug/l) or if 4 or more consecutive specimens were greater than 30 ug/l. A ''notice level'' of 15 ug/l was the point at which an employer should examine the circumstances leading toward unecessarily high exposures for an employee.

---

nium dust encountered in industrial . . . settings are seldom wholly soluble or insoluble. In reality, they are complex mixture of varying solubility.'' (I. Exh. 2 at 8.)

[56] See 42 U.S.C. § 2011–2013.

[57] The AEC's jurisdiction over governmental users of radioactive materials was transferred to the Department of Energy.

[58] For the past several years, the NRC and Japanese scientists have cooperated in a major, renewed evaluation of the Japanese atom bomb survivors. Although no official report has issued to date, the view is widely held that estimates of cancer risks from neutron radiation (which, like alpha particles, are high-LET) will be increased at least by a factor of 2. This would mean that 1 alpha rad would equal at least 40 rems. However, since no formal findings have issued, I will continue to use the quality factor of 20 for each alpha rad.

[59] NRC limit for workers in unrestricted areas and for the public is .5 rems per year, or one-tenth of the dose which occupationally exposed workers may receive.

The Respondent argued at the hearing and in its brief that Reg. Guide 8.22 was not a valid or binding standard, not only because it had not been published in final form, but more so, because it was developed with reference to uranium mills which processed ''yellow cake,'' a uranium compound which Respondent maintains differs from the greensalt used at TNS.

In place of the 8.22 ceilings, the Respondent selected an action and notice level of 100 ug/l and 50 ug/l, respectively, advising TDRH and the National Institute of Occupational Health and Safety that its standards were derived from U.S. Army handbook with the acronym, DARCOM.[60] Although the proposed 8.22 standards were not legally binding at TNS, neither were they as irrelevant to its operations as Respondent contended. In a September 1981 study of potential health hazards at TNS, NIOSH refuted Respondent's thesis that Reg. Guide 8.22 was an inapplicable standard for depleted uranium:

> Because the NRC guidelines 8.22 are based on chemical toxicity, and because depleted and natural uranium differ primarily in their isotopic composition (which does not affect chemical toxicity), it is reasonable to apply NRC guidelines for urine bioassay in uranium mills to depleted uranium facilities. (G.C. Exh. 30 at 7.)[61]

Moreover, in January 1987, the NRC affirmed the validity of the original Reg. Guide 8.22 standards by again publishing them for comment with slight revisions based in part upon new studies.[62] The NRC also issued a supplementary manual setting forth in great detail the mathematical models used to calculate the 8.22 limits.[63]

3. The administrative framework

Congress granted the NRC broad authority to enter into agreements with states which would carry out its regulatory functions in a manner consistent with the purposes of the Atomic Energy Act. Pursuant to this authority, Tennessee entered into an agreement with the NRC, thereby assuming jurisdiction within the State to regulate facilities such as TNS, in the interest of protecting workers and the public from radiologic hazards.

The NRC did not independently review a licensee's conformance with the agreement state's program. Instead, NRC personnel periodically visited the state to determine if its program was compatible with that of the federal agency. As the NRC's surrogate, TDRH promulgated regulations adopting federal dose standards, issued licenses to facilities such as TNS and conducted workplace inspections from time to time in an effort to assure compliance with the prescribed standards.[64]

The frequency of on site inspections by TDRH depended upon the potential severity of the radiation hazard. TNS was categorized as a high-risk facility. Starting in 1979, it was scheduled for the most frequent visitations on a semiannual basis.[65] After preparing an internal agency report of the inspection, TDRH issued a letter to the employer citing any violations observed and recommending corrective action. However, prior to the work stoppage, TDRH had no authority to levy fines which might have served as a forcible incentive for reform.The State's only enforcement mechanism prior to the strike was suspension or revocation of an employer's license.[66] The procedure for license revocation was administratively elaborate. In theory, it began by seeking a commissioner's order which identified the violations and the remedy sought. In the event a licensee failed to comply with the Order, procedure called for referring the matter to the State's Attorney who would decide whether to initiate judicial enforcement proceedings to close the offending facility. Charles West, assistant to the TDRH director and a TDRH employee for 21 years, made it quite plain at the hearing, that these procedures were intricate, time consuming, and involved decisionmaking at bureaucratic levels above TDRH. West testified that State attorneys told him that it would be ''very, very difficult'' to seek a license revocation. For whatever reason, TDRH did not seek a commissioner's order against TNS, or for that matter, against any other licensee.

Since, by West's account, the process to obtain such an Order was formidable, TDRH relied instead on its powers of persuasion. Over the several years prior to the strike, it sent a stream of noncompliance letters to TNS identifying recurring problems and requesting the Respondent to take corrective action. The voluminous correspondence between TDRH and Respondent attests eloquently to the extent to which the regulatory scheme vested power in the licensee to police health and safety conditions in its own house.

C. *Respondent's Compliance with Regulatory Standards*

1. Air quality surveys

State regulations required that TNS limit airborne contamination to levels or maximum permissible concentrations (MPC), which if inhaled by a worker for a 40-hour week

[60] This abbreviation stands for United States Army Material Development and Readiness Command (G.C. Exh. 14). During the hearing in this matter, Respondent stated that its standards were actually based upon a 1962 Union Carbide Corporation publication used at its facilities in Oakridge, Tennessee. (See R. Exh. 224.) The adverse parties were surprised by this disclosure.

[61] In relying on the standards set forth in Reg. Guide 8.22, NIOSH was mindful of ''the contradictions and gaps that exist among the current legal standards and nonbinding regulatory guidelines that apply to the depleted uranium industry.'' (G.C. Exh. 30 at 2.)

[62] The reissued draft Reg. Guide 8.22 is titled *Proposed Revision 1 to Regulatory Guide 8.22 Bioassay at Uranium Mills.*

[63] See NUREG-0874, *Internal Dosimetry Model for Applications To Bioassay at Uranium Mills* (July 1986).

[64] Although TNS is regulated by other State and federal agencies, TDRH is the only governmental body with jurisdiction over radioactive hazards at the facility. The Occupational Health and Safety Act of 1970 (OSHA) specifically exempts from its coverage, employer-users of nuclear materials subject to the jurisdiction of the NRC. (29 U.S.C. § 651.) Therefore, the Tennessee Department of Labor, Division of Occupational Safety and Health (TOSHA), the State analogue to OSHA, is responsible for occupational health and safety standards other than those applicable to nuclear materials, and has conducted inspections at TNS which will be discussed below.

[65] TDRH first inspected TNS in 1975. The 4-year hiatus between inspections undoubtedly was due to the Department's lack of funds for sufficient staff.

[66] In 1982, following the Gore Committee hearing on the TNS strike which exposed weaknesses in the State's enforcement scheme, the Tennessee legislature empowered TDRH to impose civil and criminal sanctions including fines up to $25,000 per day. (12 A. Tenn. Code Ann. § 68023-212.)

over a 13-week period would not result in excessive doses for the calendar quarter. In keeping with ALARA, TNS was to use process or other engineering controls to limit concentrations of radioactive materials to 25 percent of the specified MPC. (G.C. Exh. 11 at 16.) Respondent also was obliged to conduct surveys to measure the airborne contamination in order to identify its source, assess the adequacy of existing controls and redesign those controls as needed. The airborne measurements also were to be used as a tool to estimate individual intakes by exposed personnel (G.C. Exh. 11 at 16.) Respondent initially relied chiefly on its ventilatory system to control airborne contamination. As discussed previously, the employees were keenly aware that the ventilatory equipment was poorly maintained and inadequate to rid their workplace of dust and smoke bearing radioactive uranium oxides and metal particles.

Respondent's witnesses described the ventilatory system at TNS in great detail in an effort to show that it was effective. However, its claims are severely undercut by its own records which reveal that elevated levels of airborne contamination had reached critical proportions in a number of areas in the plant in the months preceding the work stoppage. Specifically, air monitoring records established that five grinding stations in the penetrator shop manned by seven operators exceeded regulatory airborne contamination limits in the final quarter of 1980 and throughout the first quarter of 1981.[67]

Paralleling these air quality findings, Respondent's bioassay records showed increased levels of uranium in the workers' urine. In response to this data, Respondent instituted a mandatory respirator program for operators at 11 different work stations, rejecting Hoynacki's alternative proposal to shut down the offending operations until the air quality problems could be remedied by engineering processes.[68]

Long before Respondent admitted that airborne contamination levels were excessively elevated, TDRH had identified the air quality at TNS as a persistent problem and frequently criticized Respondent's air monitoring collection methods. In December 1979, TDRH cited Respondent for failing to conduct continuous air monitoring surveys as required by its license, and for not using air sampling results to estimate exposures for individual workers. The internal agency report also criticized the then health and safety officer, Nancy Trivett, ''(or other appropriate TNS personnel)'' who ''are not taking steps to lessen the problem nor is she doing a complete evaluation of possible exposure to shop personnel.'' (G.C. Exh. 60a at 4.)

In the next inspection report dated May 1980, TDRH noted some improvements in the air monitoring program but still found excessive contamination in many areas of the plant. Data supporting this conclusion was introduced into evidence as an appendix to a report prepared by Dr. Mark Nelson, a physician on the International Union's staff. It documents high volume air samples far in excess of the regulatory maximum in specific areas of the plant on successive dates in April and May 1980. (See G.C. Exh. 73, appendix C.)

On August 25, 1980, TDRH wrote a firmly worded letter to TNS which stated: ''as evidenced by your facility's air monitoring, instrument survey and smear survey records, it is imperative that measures be taken to reduce radiation levels and contamination in restricted areas.'' (G.C. Exh. 60l at 1.)

Respondent's misplacement of air-monitoring equipment in positions which prevented effective sampling of the air that workers actually inhaled also proved to be a recurring problem. During a January 1980 TDRH inspection, then Inspector Hock suggested to Barlow that some air samplers in the penetrator shop which were 3 feet off the floor could not accurately measure contamination produced by the grinders which were several feet higher. Again in November 1980, an NRC official accompanying the TDRH inspector, observed that the continuous air sampler in the blending and small derby area was 10 feet away from where the operator worked. TNS was instructed to correct the problem. The same official noted that TNS' own records showed that contamination levels were consistently over the limits in the vacuum furnace area. TDRH had identified this problem in a report 6 months earlier.

TNS responded to the TDRH citation by insisting that the air sampler was placed in a location which permitted surveillance of concentrations received generally by all personnel in the area, but agreed that it would rely on portable breathing zone samplers to monitor individual employees. However, prior to the strike, TNS had only two such portable devices on hand which were rotated among over 100 employees. By the time of this trial, TNS had purchased 20 portable breathing zone samplers.

In the 5-month period preceding the work stoppage, TDRH did not examine Respondent's air monitoring records. Although inspectors visited the facility in March, they did not take the time to review air-monitoring data. In May, after the strike was underway, TDRH did attempt to review Respondent's quarterly air monitoring records, but on that occasion, Hoynacki refused to divulge Respondent's records, claiming that they were proprietary information.

TDRH engaged in less hasty inspections in October and December 1981. These tours had as their primary purpose a review of exposure records covering the period from October 1, 1980, to September 30, 1981. TDRH confirmed that air quality ceilings at work stations in the foundry were exceeded in the last quarter of 1980 and the first quarter of 1981.[69]

Based on these inspections, TDRH issued a noncompliance letter dated January 28, 1982, citing TNS for failing to take corrective steps when instrument and smear surveys revealed radioactive material in excess of Company established action levels; for allowing air sampling periods to continue beyond

[67] As noted previously, employees rotated jobs. Therefore each of the penetrator shop operators could be assigned to any one of the grinders. Employees also rotated to different work stations in the foundry where during the same time period, airborne contamination exceeded regulatory limits in the derby breakout, jolter, mold and crucible preparation areas.

[68] Since the strike, TDRH has issued license amendments to TNS which provide that the Respondent shall shut down a new operation whenever it produces airborne contamination which exceeds 25 or 50 percent of MPC for 5 working days, depending on the nature of the operation. The authority to order a shut down until the problem is remedied now rests with the plant's health and safety officer. Previously, no one in middle management, such as Barlow or Hoynacki, had such powers.

[69] Curiously, TDRH failed to mention the admittedly excessive airborne contamination levels at grinder stations. (See G.C. Exh. 60qq.)

one shift, for relocating at least one air sampler; and for failing to record beta activity on smear and instrument surveys.

Air quality problems did not abate altogether when TNS resumed operations after the strike. A TDRH inspection in February 1982 found that numerous high readings from breathing zone samplers continued throughout the last quarter of 1981. The state inspector recommended citing TNS for noncompliance in that ''air concentrations in many areas exceeded 25 percent of . . . (MPC) and adequate process or other engineering controls were not being used.'' (G.C. Exh. 76oo.)

2. Whole body radiation exposures

Because radiation cannot be discerned by any of the senses, employees must be provided with sensitive devices which measure external radiation exposures. The primary instrument used at TNS to measure the external beta dose was the thermoluminescent dosimeter, or simply, the TLD badge, which each employee wore on his person at chest level whenever they were in a controlled area of the plant.[70]

After reviewing Respondent's TLD records, NIOSH reported that from 1975 to 1980, mean annual doses for the production workers ranged from 1.06 to 2.16 rems.[71] The NIOSH report also showed that between 1975 and 1978, three employees were exposed to whole body doses of 5 or more rems, but since that time the 5 rem ceiling was not exceeded. In these same years, 7.2 percent of the work force registered doses of 3 to 4.99 rems, 44 percent received doses of 1 to 2.99 rems, 15.6 percent were between .5 and .99 rems and 32.3 percent received less than .5 rems. (G.C. Exh. 30 at 28) Available records for employees who worked the full year of 1980 show an average whole body dose of 2.43 rems. (G.C. Exh. 9 at 65–67.)

A closer look at the exposures received during the 2-year period prior to the work stoppage (excluding the first quarter of 1981) reveal a disturbing trend toward larger whole body doses.

	Less than .5 rems	*0 - .9*	*1-2.99*	*3-4.99*	*Total Work Force*
1979	27	7	39	6	79
1980	26	19	74	11	130

In 1978, the mean exposure for the total employee population was .74 rems; in 1979, the mean rose to 1.47 rems and in 1980, to 1.52 rems.[72] (G.C. Exh. 30 at 27.)

While recognizing that the NRC standards limit whole body radiation doses to 5 rems per year, the NIOSH report pointed out that such doses are expected to be less than 10 percent of the legal limits. The NIOSH study also observed that in 1978, workers in other parts of the uranium fuel cycle averaged .2 rems or less with over 90 percent receiving doses less than .5 rems.[73] In startling contrast to these national averages, the NIOSH investigators found that the mean annual whole body dose for TNS workers between 1975 and 1980 ranged from 1.06 rems to 2.16 rems. Stated another way, in 1978, 45.8 percent of Respondent's hourly production employees received whole body doses in excess of the dose received by 90 percent of other nuclear workers in the nation; in 1979 this figure rose to 65.8 percent and in 1980, to 80 percent of the TNS work force.

3. Internal uranium burdens

After entering the body, radioactive material migrates to particular organs or parts of the body depending upon the particle size and biochemical characteristics of the material.[74] Since Respondent had not conducted any study prior to the strike to pinpoint the special characteristics of the uranium compounds at TNS, NIOSH assumed that DU was a relatively insoluble (Class W) substance, which means that it had a 10- to 100-day biologic half life in the lung. Thereafter, 50 percent of the substance is removed from the lung by gradual dispersion into the body fluids. These fluids transport and deposit a portion of the radioactive substance in the gastrointestinal tract and the kidneys where some of it is ultimately excreted either through feces or urine. Thus, when discussing internally deposited DU, the organ of greatest concern from a radiologic point of view is the worker's lung because the inhaled, high-LET alpha particles remain in that organ for relatively prolonged periods of time.[75]

The amount of uranium deposited within the lung is measured directly by the ''in-vivo'' lung scan, also known as ''whole body testing.'' In compliance with state regulations, in late 1978, TNS began to administer such scans to its employees semiannually. To analyze the TNS employees' in-vivo data, NIOSH assigned a quality factor (QF) of 20 to each alpha rem as recommended by the ICRP, rather than a QF factor of 10, the outmoded figure used by Respondent and its testing service, the Helgerson Company. Applying the more stringent QF, NIOSH concluded that ''the data from in-vivo monitoring suggests an inadequate margin of safety. . . . It can be inferred that 32 percent of the hourly work force . . . had a yearly dose to the lung of 5.3 to 15.9 rems. . . . Although the accepted radiation guidelines allow a maximum annual dose of 15 rems, the ALARA concept calls for considerably lower body burdens.'' (G.C. Exh. 30 at 15.)

[70] Employees also wore pocket chamber or ''pen'' dosimeters, to measure gamma radiation and some were furnished ring badges which measured radiation doses to the hands. Internal radiation doses were detected by lung scans while the urinalysis bioassays were used to evaluate chemical toxicity.

[71] The data for 1981 was not included since the employees worked only one calendar quarter prior to the work stoppage.

[72] Figures are rounded out to the nearest whole number.

[73] NIOSH extracted this data from an NRC summary of occupational exposures in the United States. (G.C. Exh. 30 at 26.)

[74] Respondent performed no study prior to the strike to determine the particle size and aerodynamic range of the radioactive emissions in the plant. In the absence of such a study, the NRC recommends assuming an average particle size.

[75] The rate at which radioactive matter is metabolically cleared from the pulmonary region of the lungs is classified according to the solubility properties of the isotope. The most current report, ICRP Publication 30, *Limits For Intakes of Radionuclides By Workers*, (1979), recommends the following solubility categories: (1) class Y refers to highly insoluble material which remains in the body for a biologic half time of at least 100 days, (2) class W refers to relatively insoluble material which has a 10 to 100 day biologic half life and (3) class D includes highly soluble materials which are excreted rapidly from the body within 10 days. (See R. Exh. 472 at 24.) These categories superceded the simpler ''soluble/insoluble'' classifications established by ICRP Publication 2.

TDRH also considered the QF used by TNS as too conservative. Moreover, after reviewing the Company's in-vivo records for the year prior to the strike, TDRH concluded: ''Many employees experienced an increase in measured lung burden over as little as a . . . 6 month period. Even when compared with the body burden value you (TNS) used at the time . . . the increases appear excessive.'' (G.C. Exh. 76f at 4.)

While inhaled uranium poses a radioactive threat to the lungs, it constitutes an equal if not greater hazard to the kidney by virtue of its chemically toxic properties. In light of this risk, TNS was required to administer a bimonthly bioassay program involving the collection of urine samples from employees to determine uranium levels in the kidney.

TDRH regulations provide that employees have a right to review their radiation exposure records. The Respondent maintains that while the data was always available, the employees never asked for it. Several TNS employees testified to the contrary that they did request their records but were unsuccessful in obtaining them. Instead, from time to time, employees learned from their supervisors or from a health and safety staff member that his count was ''high.'' When this occurred, the employee might be asked to submit additional samples over the weekend or, more rarely, was removed from his job and assigned to another position until he was given clearance to return to his regular station.[76]

Even if the workers had reviewed the data, it is unlikely they would have understood what the figures meant or the significance to be attached to them. Moreover, regardless of aptitude, no employee had the right to review all the records in a way which would permit systematic assessment of trends among the entire TNS working population or comparisons with other workers in the nuclear industry. TDRH saw some employees' exposure records during semiannual inspections, but typically, it reviewed data generated during the preceding quarter. Thus, there is no evidence that any individual or agency examined the bioassay results prior to the work stoppage to determine whether cumulatively, employee exposures were excessive.

Dr. Mark Nelson, a physician on the International Union's staff, was the first person to undertake a comprehensive analysis of the TNS employees' urinalysis records. He presented his findings in testimony before the U.S. House of Representatives Subcommittee on Investigations and Oversight, (referred to as the Gore Committee, so named for its chairman, then-Congressman Albert Gore Jr.), and subsequently appeared as an expert witness in this proceeding.[77]

Dr. Nelson found that whether measured by the NRC proposed Reg. Guide 8.22 or under the Company's standards, 53 of the approximately 100 striking employees exceeded one or both of these guidelines.[78] Single high readings above the Reg. Guide ceilings were common. Specifically, 45 specimens taken between 1979 and 1981 registered uranium content above the 130 ug/l maximum. In 1980, 7 employees had 12 uranium-in-urine readings above the 130 ug/l limit; in the first quarter of 1981, 9 workers had 22 such readings. Among the employees who engaged in the work stoppage, 20 had urine readings above Respondent's 100 ug/l standard in 1980, while in the first quarter of 1981 alone, 11 registered results over 100 ug/l.

Dr. Nelson regarded consecutive high readings as a greater concern than asingle high urine result. In this regard, he found that 30 employees had consecutive readings above 30 ug/l in 4 or more sampling periods. Several of the 30 had as many as 7, 8, 9, and even 15 consecutive readings above the 30 ug/l limit. Since samplings are collected every 2 weeks, these consecutive results meant that 11 employees were exposed beyond the proposed maximum for 24 weeks while another 14 employees were exposed beyond the proposed regulatory limit for as much as 30 weeks.

Dr. Nelson further determined that between January and April 1981, 14 employees sustained uranium doses to the kidney in excess of the proposed Reg. Guide 8.22 maximums, with the average concentration being 89 ug/l. Although another 17 operators in the penetrator shop wore respirators for a considerable period of time prior to the work stoppage, Dr. Nelson found that 10 of the wearers had uranium concentrations of 30 ug/l or greater for the entire period (G.C. Exh. 73, appendix C).

Like Dr. Nelson, the authors of the NIOSH report regarded proposed Reg Guide 8.22 as applicable to TNS as it was to uranium mills since the difference between depleted and natural uranium did not alter the chemical toxicity of the substances. NIOSH compiled the TNS urinalysis data between 1977 to 1981 in a somewhat different form than did Dr. Nelson, but its tabulations reflect similar disturbing trends. Thus, the number of workers with one urine sample equal to or greater than Respondent's 100 ug/l standard rose from 15.6 percent in l978 to 22.4 percent in 1980.[79] Using Respondent's own standards, 33.8 percent of the hourly workers had samples equal to or greater than the 50 ug/l notice level in 1978 and; by 1980, 60 percent of the work force exceeded that level. NIOSH also found that each year between 1977 and 1981, an average 52 percent of the work force had one or more urine samples greater than the DARCOM notice levels of 50 ug/l and 19.5 percent had one or more samples greater than 100 ug/l (G.C. Exh. 30 at 16 and Table 13).

TDRH administrator West noted that during the two calendar quarters preceding the strike, 158 urine specimens exceeded Respondent's notice level of 50 ug/l, of which 37 or 23 percent were above the 100 ug/l action level. Of this group 6 employees, or 16 percent of the work force had ura-

[76] In an alert health and safety program, elevated readings on a TLD badge should result in shifting the overexposed employee to a less contaminated work station. Unfortunately, this was not invariably the procedure at TNS. In January 1980, Barlow confided to a TDRH inspector that consistently high exposures were partially an administrative problem since ''It is more economical to leave a person at the same position that he/she aleady works efficient at, no matter what kind of exposure that he/she may be exposed to consistently.'' (G.C. Exh. 60ff at 2.) Barlow was not called as a witness and no evidence was introduced to refute comments attributed to him.

[77] The Gore Committee issued a report entitled Health Hazards at TNS, Inc., which included written statements and a verbatim transcript of the proceeding. See, Hearing Before the Subcommittee on Investigations and Oversights of the Committee on Science and Technology, U.S. House of Representatives, 97th Congress, 1st Sess. December 8, 1981 (G.C. Exh. 9).

[78] Respondent did not dispute Dr. Nelson's factual findings, but objected to inferences he drew from this data.

[79] NIOSH did not calculate percentages for 1981, explaining that it would be inappropriate to include results taken only during the first quarter of that year.

nium-in-urine levels surpassing the 1000 ug/l limit. (G.C. Exh. 76rr at 4.) When Hoynacki suggested that several of the readings over 1000 were due to one employee's poor hygienic habits, West wondered wryly ''how were they able to clean him up enough to get a low in-vivo reading?'' (Id.)

D. *Respondent's Respirator Practices*

1. Regulations governing respirator use

The ultimate objective of the NRC and TDRH regulatory standards is to protect individuals from hazards caused by exposure to radioactive materials. To achieve this end, the licensee was exhorted to use process or other engineering controls, to limit concentrations of radioactive materials in air.[80] (G.C. Exh. 11 at 16.) When such controls are impracticable, then other precautionary measures ''such as increaseed surveillance, limitation of working times or provision of respiratory protective equipment, shall be used to maintain intake of radioactive material by any individual within any period of seven consecutive days'' as far below MPC as is reasonably achievable. (Id.) If respiratory equipment had to be used, licensees could not assume that employees were adequately protected unless they observed the following strictures of NRC Reg. Guide 8.15:[81] (Id.)

(1) A written respirator policy statement must be issued by high-level management, accompanied by measures to ensure that the policies are implemented. (2) Respirator equipment must supply a ''protection factor'' (PF) greater than MPC. PF refers to the degree of protection afforded by a respirator. The half-face mask used at TNS had a PF of 10. In other words, if airborne contamination at the plant measured 100 percent of MPC, the PF provided by the respirator theoretically would mean that its wearer was not exposed to contamination greater than MPC. However, Reg. Guide 8.15 contained several caveats: first, that the protection factor applied ''only for trained individuals wearing properly fitted respirators used and maintained under supervision in a well-planned respiratory protective program'' and second, that a half-mask respirator would be well-fitted where the face is shaven and ''nothing interferes with the seal of tight fitting facepieces against the skin.'' (G.C. Exh. 13 at 4.) (3) The licensee must advise each respirator user that he may leave the area at any time for relief in the event of such conditions as equipment malfunction, physical or psychological distress, procedural or communication failure, or significant deterioration of operating conditions. (4) The licensee must maintain and implement a respiratory protection program that includes, at a minimum (a) recorded air sampling and other surveys which identify the hazard, and evaluate individual exposures; (b) written procedures which insure proper selection, supervision and training of personnel in using the equipment; adequate fitting of respirators; (c) procedures to ensure that the respiratory protective equipment is treated prior to each use; and (d) procedures which govern cleaning, decontaminating, inspecting, repairing and storing the respirators. (5) The wearer must be medically examined prior to using the respirator to assure that he is physically and mentally able to perform his assignment while using such equipment.

To provide detailed technical guidance for implementing acceptable respirator programs, the NRC published a *Manual of Respiratory Protection Against Airborne Radioactive Material*, otherwise referred to as NUREG 0041 (G.C. Exh. 12.) At the outset, NUREG 0041 posits that a worker's exposure to airborne contaminants is best limited by engineering controls such as containment and ventilatory equipment. NUREG 0041 explains why resort to a respirator must be brief: ''anyone wearing a respirator experiences discomfort: vision is restricted, breathing is more difficult; ventilation across the face is limited; equipment is cumbersome, and restricts movement and may be uncomfortably hot; an improperly fitted mask may cause intolerable pain spots.'' (G.C. Exh. 12 at 2.) In light of these drawbacks, the NUREG states that the worker often is unwilling to wear the respirator and use it properly. Consequently, respirator use entails ''both greater likelihood of accidental exposures and greater likelihood that such exposures may go undetected.'' (Id.) After suggesting that the prolonged use of respirators is self-defeating and may exacerbate the very problem which the equipment is supposed to prevent, NUREG 0041 urges licensees to keep respirator use to a minimum.

2. The pre-1981 respirator program

Prior to 1981 when the Respondent instituted a mandatory respiratory program, employees wore respirators on an ad hoc, intermittent basis; respirator policy and practice was a slapdash matter, clearly falling far short of the regulatory requirements outlined above. Initially, TNS had a brief written policy which called for the use of respirators when the dust was ''excessive,'' a term which it did not define. Since the plant was continuously dusty, the answer to the question of how ''excessive'' dust levels had to be before respirators were required depended on the subjective perceptions of various supervisors. Moreover, the record reveals that many employees were not assigned a respirator until months, even years after their dates of hire. Evelyn Rimel, for example, was issued a respirator in 1980, but did not know where it was kept and never wore it until 1981.

Employees received only cursory preemployment medical examinations and were not specifically tested to determine whether they were suitable candidates for respirator use. They were responsible for cleaning their respirators but were provided no special hygienic facilities for doing so.

Those employees with assigned respirators stored them in plastic sacks in lockers on the dirty side of the change room, and had to obtain their supervisor's permission before retrieving them. Only the more diligent, knowledgeable, or cautious employee took time to fetch his mask while engaged in a routine task. However, even the diligent employee would not necessarily have time to retrieve his respirator when a blowout suddenly erupted. Some employees made sure that their respirators were available at their work stations, but then left them there uncovered. Under such conditions, an unprotected face mask inevitably was contaminated.

---

[80] It is understood that ''process or engineering controls'' refers generally to some form of shielding placed on or around machinery so as to confine contamination. See *An Introduction to Radiation Protection* at 85 et. seq.

[81] The TDRH regulations applicable to respirator use closely track those of the NRC. (Compare 10 CFR 20.103 with G.C. Exh. 11 at 5-05(5.) Although the State code expressly incorporates by reference Reg. Guide 8.15 which describes the elements of an acceptable respiratory program, TDRH inspector West admitted he was only vaguely familiar with its requirements.

Respirators left exposed at work stations caught the disapproving eye of at least one TDRH inspector.

The Respondent did not enforce its own written policy regarding respirator usage. Foremen who had no more training in the use of such equipment than did their crews, were responsible for implementing the program. Several employees testified that supervisors tolerated and even encouraged disregard of respirators. One employee, William Mohler, testified without contradiction that his supervisor told him simply not to get caught without his respirator. Joseph Murphy's supervisor said he need not wear a respirator on the night shift when upper level managers were off duty but he should put it on before the day-shift employees arrived as if he had worn it consistently. Other employees who found that they could not perform welding tasks while wearing both welding helmets and respirators were permitted to work without masks. Following the work stoppage, Respondent purchased special welding helmets with self-contained air packs.

When TDRH resumed inspecting TNS in September 1979, the respirator program was cited for several serious deficiencies. (See G.C. Exhs. 60a and b.)[82] The Company's president denied the charge in a letter of December 17, 1979, asserting that personnel were ''adequately trained in measures to maintain respiratory protective equipment in effective condition.'' (G.C. Exh. 60c.) At the same time, he promised that ''Future evaluations and actions concerning the respirator protection program will be maintained in a manner more compatible with'' state regulations. (Id.)

Apparently dissatisfied with this response, TDRH gave TNS 15 days to develop a satisfactory respirator program based on NRC Reg. Guide 8.15 and NUREG 004l. By letter of January 27, 1980, Respondent promised that respirators would only be used as a temporary or interim measure of air quality control. The letter also outlined other elements of a respirator program which generally mirrored the requirements of NRC Reg. Guide 8.15.

After his appointment as Resident Safety Officer in January 1980, Barlow improved the respirator practices at TNS somewhat. Between February and June 1980, he distributed 17 new respirators among some 35 employees. He also gave group training sessions in respirator wear and care, initiated a more convenient method for cleaning them, and provided a special respirator storage locker on the shop floor.

3. The mandatory respirator program

As production at TNS expanded in the latter part of 1980 and into the spring of 1981, risks to employees' health followed suit. During these months, Respondent's surveys were recording airborne contamination levels in excess of MPC. At the same time, a number of employees in the penetrator shop were submitting urine specimens with a uranium content above Respondent's action level of 100 ug/l. These matters were not reported to TDRH as required. Hoynacki proposed shutting down the offending operations but Respondent rejected his proposal. Instead, it instituted a mandatory respiratory protection program for any employees who rotated into 7 locations in the penetrator shop and 5 areas in the foundry.

Approximately 1 month later, in the latter part of February, Brad Squibb, a health and safety technician newly charged with responsibility for administering the respirator program, began giving 10-minute training sessions to employees on an individual basis.[83] Under Squibb's tutelage, 31 employees were given masks, bringing the number of employees with personally assigned respirators to 86. Prior to the work stoppage, 19 employees had not been assigned respirators leaving them with no protection during a period when the air quality at TNS was at its worst.

The Respondent does not deny that before commencing the compulsory respirator program medical exams were not given to determine whether employees had preexisting physical or mental conditions incompatible with respirator usage. Squibb explained that he regarded the workers' regular preemployment physicals as sufficient. Since he never reviewed these medical reports he is ill-suited to offer any opinion as to their value.[84]

One of Respondent's expert witnesses, Dr. Clarence Lushbaugh, suggested that medical examinations were superfluous for the employees themselves were in the best position to determine whether they were adversely affected by prolonged respirator wear. Dr. Lushbaugh's pragmatic approach (which depended upon the employee complaining about discomfort only after having worn the respirator) conflicts with the sounder and more humane judgments of the academic, industrial and government experts who authored NUREG 0041. Moreover, employee complaints were not well received. In the spring of 1981 when 3 or 4 employees complained of adverse effects from the persistent use of respirators, they were relieved of their duties until such time as they returned to the plant with medical excuses.

Although Squibb's training course was an improvement over the employees' prior indoctrination, 23 workers, some of whom operated the troublesome grinders in the penetrator shop, continued working for several weeks in respirators which were known to be leaking. Three of these employees never received respirators which sealed adequately. But even assuming that every employee had a perfectly fitting mask, some were not adequately protected during those periods when the contamination levels exceeded the mask's PF factor.

The employees described the fit tests which Squibb administered, indicating that the brief exercises which he directed them to perform did not simulate their actual working conditions. The employee witnesses did not recall that Squibb told them how often the respirator filters were to be changed. Rather, they learned from experience that new filters were needed when great effort was required to breathe through their masks. However, even when they requested new filters from their supervisor, replacements were not invariably available. The Respondent clearly did not comply with the Reg. Guide's dictate that new filters were to be supplied after each respirator use.

The employees did not recall that Squibb told them they could take breaks whenever necessary to obtain relief from respirator wear. Although Squibb maintained that he orally

[82] TDRH noted that these same inadequacies had been reported in 1974.

[83] The training was offered to most employees between February 16 and 20, but some received it was even later.

[84] Several employees testified without contradiction that their preemployment medical examinations were extremely cursory.

advised supervisors that employees were to be given liberal breaks for this reason, compliance once again was left to the supervisor's discretion. Whether out of a desire to achieve production goals or simply to prevent unnecessary fraternization, some supervisors allowed employees to leave their work stations only one at a time to seek momentary relief.

Other requirements of Reg. Guide 8.15 also were ignored. For example, the respirators were not inspected for deterioration or leakage. Also, responsibility for cleaning their respirators rested with the employees who performed this task under less than ideal conditions. A respirator cleaning station was improvised in the old thorium bay which at that time, was used as a waste storage area. Three lidded buckets were installed next to the jaw crusher, a machine which crushed and reduced slag prior to its shipment to a hazardous waste disposal site. Two of the buckets held cleansing solutions and a third, rinsing water. The employees testified that as the day wore on, the dirt from their masks or from the jaw crusher caused the solutions to become grimy and murky. Squibb did not change the contents of the buckets until the end of the day. Therefore, far from decontaminating their respirators, the employees often were plunging them into solutions full of the very radioactive waste which the respirators were supposed to interdict.

As the mandatory use of respirators continued during the spring of 1981, the employees reacted to the imposed regime with complaints going beyond those of mild discomfort. Penetrator shop operators Larry Garst and Mickey Lenoir testified that they experienced shortness of breath, persistent headaches and nausea. John Innello found that the heat from the respirator fogged his glasses and impaired his vision. Rimel testified that the respirator, which was made of a rigid rubber-like substance, pressed tightly on her safety glasses causing such pain that she could not concentrate on her work. She felt that she was working ''in a bear trap.'' Ricky Decker also found the heat inside his respirator unbearable. As he put it, ''it's like being muzzled.''

Predictably, the employees found ways to relieve their distress. Rimel stated that employees would take turns going to a doorway to gulp in fresh air. She admitted that she removed the gaskets from her respirator so that she could breathe more easily. Other employees testified that to seek relief they would temporarily remove their respirators or loosen straps which bound the respirators to their heads. Some workers left their machines as frequently as possible to go to the cleaning station. However, Garst was warned twice for leaving his job for that purpose. Evidently, Squibb's message to the supervisors that employees might take breaks whenever necessary was either not well-communicated, forgotten, or ignored.

By 1983, TNS had greatly improved its respirator practices. During preemployment medical examinations, new employees received pulmonary function tests designed to detect respiratory impairments. Strikers recalled to work during this time observed that respirators were worn infrequently and employees no longer cleaned their own masks. Instead, after each use, however brief, employees turned in their respirators to health and safety personnel who cleaned them in a special room. In conformance with NUREG 0041, health and safety personnel also tested the respirators for adherent contamination after each use and changed the cartridges frequently. Respondent cannot claim that these innovations reflect advanced knowledge for the practices that TNS adopted in 1983 were those prescribed by Reg. Guide 8.15 and NUREG 0041, both of which were brought to the Company's attention long before the strike.

4. Respondent's defense of its respirator program

In testimony before the Gore Committee, in letters to TDRH, and at the instant hearing, Respondent's officials claimed that its mandatory respirator program was a temporary solution imposed only until process and other engineering controls could be installed to contain admittedly elevated airborne contamination levels. The Respondent contends that as a temporary expedient, such respirator use was consistent with the TDRH regulations and that the respirators fulfilled their protective mission.

By no stretch of the imagination can Respondent's mandatory respirator program be characterized as temporary. Its program failed to conform with TDRH regulations not only because of its duration, but also, because of the manner in which it was implemented and administered. Further, the record does not support Respondent's contention that the employees were well protected while the program was in effect.

Respondent's claim that the respirator program was a short-term expedient is completely contradicted by a more candid assessment in a report prepared by Radiation Management Consultants (RMC), a firm TNS hired to evaluate its health and safety program shortly after the strike began. The report (G.C. Exh. 10) is discussed in detail in Part Two, V,A.

5. TDRH reviews of the TNS respirator program

TDRH inspection reports and voluminous correspondence with TNS demonstrate that TDRH, like RMC, regarded Respondent's respirator program unfavorably although neither evaluator had complete information about the deficiencies. During a visit to the TNS plant in March 1981, just 6 weeks prior to the strike, a TDRH inspector noted with apparent disapproval, that almost all workers in the derby, incinerator and mold prep areas were wearing respirators. In a discussion with Hoynacki, the inspector stated that studies should be conducted to reduce such overuse; that ''routine (full 8 hour shifts) use of mask [sic] is not to be done. Their use should be . . . for unusual, emergency or short duration jobs.'' (G.C. Exh. 60v at 2.) In the next inspection on May 5, conducted pursuant to a complaint filed by OCAW, TDRH inspectors again found excessive reliance on respirators. The inspector determined ''After many carefully-worded questions and much record review . . . there were individuals in the penetrator shop who were being required by management to wear respirators for the duration of 8-hour working shifts.'' The TDRH agents apparently were not told that employees other than penetrator shop operators were required to wear masks for much of their working day or that the compulsory program had been in effect since January 23.[85] Based only on what was disclosed in the May inspection, TDRH sent TNS an unusually brief letter of noncompliance stating that ''Process and engineering controls were not sufficient to limit concentrations of radioactive materials con-

[85] Rimel testified that because of the nature of her tasks, she too, had to wear a respirator for virtually her entire shift.

trary to state regulation.'' (G.C. Exh. 60dd.) The letter makes no reference to respirators.

Responding to the state citation on June 17, TNS described several possible remedies which might cure its air quality problems. Respondent further acknowledged that in early January, when monitoring data showed that airborne contamination exceeded MPC, it immediately implemented the use of respiratory protective equipment which would remain in effect until the problem was resolved.[86] This TNS letter neither mentioned that MPC was exceeded for the entire first quarter of 1981 nor explicitly stated that respirators were mandatory from January 23, 1981, until the strike began.

Subsequent correspondence suggests that TDRH was not aware of the duration or breadth of the TNS respirator program. Thus, in a letter dated April 5, 1982, TDRH asked Dr. Schell to ''explain why the information regarding a mandatory respiratory protection program was withheld from or at least not made available to inspectors at the time of their visits inasmuch as it is such an important element in employee exposure control. Only through extensive questioning and record searching were we informed of a mandatory program in the penetrator shop (note that no penetrator shop area was included in citation'' (G.C. Exh. 60g at 1).[87] Shifting the blame to TDRH for this communication gap, Dr. Schell answered on April 29, 1982, that ''perhaps specific information on the respiratory inspection program was not made available to the inspectors because they failed to ask the kind of questions that would have brought such information to light.'' (G.C. Exh. 60h at 1.) Then, for the first time, Respondent specifically identified 11 operations in the penetrator shop and foundry where a mandatory respirator program was formally implemented in January 1981. Without question, this correspondence reveals that TDRH was not fully informed and was concerned about the protracted nature of Respondent's respirator program. Indeed, West's cryptic parenthetical reminder that no citation was given for the prolonged use of respirators suggests that TDRH would have acted had it been aware of the situation sooner. However, by 1982, when TDRH finally possessed a more complete picture of conditions at TNS, the affected employees had long since left the plant. At that point, the state agency did not view the compulsory use of respirators as a circumstance requiring extraordinary response. As a former TDRH Director, admitted to the Gore Committee, Respondent's noncompliance in that regard was no longer ''pertinent.'' (G.C. Exh. 9 at 295.)

Respondent asserts that declining urinalysis values in the spring of 1981 prove that the compulsory respirator program was effectively reducing the employees' exposure to airbone contaminants. It is true that according to Respondent's data, employees' uranium-in-urine values decreased after March 1981. However, prior to that month, Respondent used different sampling procedures than were used later. Before March, employees were permitted to submit urine samples over the first several days of the week whereas beginning in March, Respondent insisted that employees provide specimens early on Monday morning after they had been away from work for the weekend and before they entered the controlled area of the plant. Given the weekend hiatus, some of the soluble uranium substances were cleared from the employees' kidneys. In addition, in late January 1981, some of the penetrator shop operators with the highest uranium-in-urine-content were removed to less contaminated areas of the plant. Therefore, their bioassay values should not have been commingled with the test results of the remaining penetrator shop operators. These circumstances and variations in urine collection procedures invalidate comparisons between specimens taken before and after March 1981. Even if Respondent's data could be relied on to show some reduction in urinalysis results, Respondent itself acknowledged that the bioassays continued to show values that remained too high. The persistence of elevated urinalysis scores can be explained by a flawed respirator program and by such other factors as air quality in excess of the respirator's PF factor, leaking, ill-fitting respirators, and cheating by employees who removed their masks to breathe inordinately contaminated air without restraint.

This discussion of the TNS respirator program is not intended to establish violations of NRC or TDRH regulations for the purpose of imposing sanctions, or to evaluate the effectiveness of the administrative agencies' compliance actions. However, the standards imposed by the regulations, the degree of compliance with those regulations and the critical assessment of TNS's program by TDRH are important to note in order properly to address the employees' complaints and actions. Within the regulatory framework, it becomes clear that Respondent's protracted and poorly administered respirator program imposed intolerable working conditions on its employees. Rather than protecting them, Respondent's demand that they wear respirators for prolonged periods drove them to cheat, and in doing so, to expose themselves to hazardous airborne contamination.

E. *Employee Training*

Recognizing that an employee who is well-informed about the potential hazards in his workplace is essential to the conduct of an effective health and safety program, the TDRH regulations impose on licensees the duty to inform all workers in radiation controlled areas about ''the hazards associated with exposure to such radiation (and) . . . precautions or procedures to minimize radiation exposure . . . .'' (G.C. Exh. 11 at 26; see also 10 C.F.R. 19.12.)

The record in this case reveals that the persons responsible for the training and the health and safety program at TNS varied widely in their competence and commitment to the workers' health. As a consequence, the employees were poorly trained and ill-prepared to fully appreciate the need to take maximum precautions against exposure to the dangerous substances with which they worked.

Orientation

The employees' official introduction to health and safety at TNS was by way of a perfunctory orientation session. I assume that Ricky Decker's experience was illustrative for he was hired in April 1980 during a period when TNS was

[86] Other exchanges between TDRH and TNS at the time of the work stoppage will be discussed further below.

[87] Apart from decrying the duration of the respirator usage, TDRH did not evaluate any other aspect of Respondent's respirator program to determine whether it complied with NRC guidelines. TDRH may have been remiss in this regard, but the RMC consultant was not. (See G.C. Exh. 10.)

doubling its work force.[88] Decker met first with Ronald Sparks, who as industrial relations manager, had no experience in health matters. Sparks told Decker about his job assignment, change room procedures and the bimonthly urine samples. He then gave the new employee a paper outlining plant health and safety rules. Decker read the rules but was not given a copy to keep. Decker next went to the health and safety office where he was given a TLD badge and pen dosimeter. He did not receive a respirator until 8 months later. Next, Decker was taken to the employee who trained him in operating the equipment. Decker was not told that working with DU could produce adverse health affects.

Other employees were equally misinformed at the time they were hired. When Rimel was first employed in April 1980, she was advised by the general foreman that nothing would happen to her if she took care and that radiation from DU was no worse than one would get from the sun or from an airplane flight. She was told that she would have to submit urine specimens but had no idea for what purpose. When John Bettis specifically asked about hazards prior to being hired he, like Rimel, received blithe assurances about benign working conditions. Like Rimel, he did not know why he was being asked to provide urine samples. Similarly, John Innello was left in ignorance by management personnel. He was given a TLD badge but fellow employees had to reveal its purpose to him. Initially, he was assigned only one locker on the dirty side of the change room in which he stored both his clean and contaminated clothing. Innello also admitted that he collected filter bags full of contaminated dust from the dust collectors and threw them into the waste storage area until he was instructed otherwise.

Weekly Training Sessions

Prior to the work stoppage, the persons directly in charge of the employees' training and compliance with health and safety regulations were the shop foremen who prior to their promotion from the ranks had as little knowledge of such matters as did their fellow workers.

The foremen assembled employees under their supervision for weekly meetings lasting approximately 15 to 30 minutes. Generally, the foreman read a prepared text on a subject dealing with some health or industrial safety issue. Occasionally, supervisors discussed topics of their own choosing. If on a rare occasion, an employee asked a question, the foreman promised to convey it to a health and safety officer. Decker did not recall that his questions ever were answered. At the conclusion of the training meeting, the employees were required to sign a form signifying their presence at the session. As tensions increased during collective-bargaining negotiations in the spring of 1981, some employees refused to sign the sheets. In these instances, the supervisor read the material to and signed the sheet for the reluctant employees. One supervisor, a former operator, admitted that he did not understand the training materials but simply read them to the employees as required. Innello characterized the meetings he attended as ''pep talks'' with some remarks directed to plant cleanliness.

[88] Fifty-four employees were hired in 1980; approximately half of the complement which participated in the work stoppage.

The Health and Safety Staff

When TDRH inspected TNS in Spetember 1979, they found disturbing deficiences in the radiologic safety program, some of which they attributed directly to the then-resident safety officer, Nancy Trivett.[89] The Department's noncompliance letter of December 3, 1979, cited the Respondent for 16 violations, including the following which bore specifically on inadequate training: ''Training in . . . procedures to minimize radiation exposure was inadequate.'' Also, ''instruction in the proper use of personnel monitoring equipment was inadequate . . . .'' (G.C. Exh. 60b at 1, 2.)

TDRH viewed Trivett's successor, Jim Barlow, as a decided improvement.[90] However, recognizing that Barlow could not perform miracles, and that five more like him were needed, the TDRH inspector indicated that many safety problems remmained. The inspector also noted with approval that TNS had hired two technicians, Brad Squibb, who had a bachelor's degree in environmental health, and Timothy Wright, a high school graduate.

Apparently impressed by Hock's talents as an inspector, Respondent employed her as a member of its health and safety staff in the fall of 1980. Soon after her arrival, she and Barlow attempted to upgrade the training program by personally offering instruction to the employees at some of the sessions usually conducted by foremen.[91]

However, they did not impress the employees as great communicators, presenting subjects in terms too theoretical and technical for their audiences to grasp. The employees testified that they left these lectures with no more information than they had when they arrived. They felt that they had not fully understood the material presented, could not retain much of it and did not perceive how it could be practically applied. It cannot be assumed that the fault lay solely with the employees' lack of comprehension for a number of them impressed me as possessing at least average if not above average intelligence.

In Rimel's opinion, Barlow and Hock were difficult to comprehend. Barlow's reference to ''daughter products'' and ''half-lives'' had no meaning for her. If Rimel, an obviously bright woman, was confounded, then certainly others were confused as well. The test which Hock gave at the end of one lecture to determine the employees' comprehension was as complicated and puzzling as the lecture itself. The employees never were told how badly they faired on the test and nothing was done to remedy their ignorance the test exposed about the esoteric material presented by their instructors. While the employees ostensibly were being trained in health and safety matters, they also were beguiled by inaccurate, if not misleading, information. Rimel recalled that

[89] A resident safety officer (RSO) is described in the TDRH regulations as ''The qualified individual directly responsible for the safety of all persons at installation. . . . This individual shall have the authority to stop operations whenever he believes the persons are being endangered.'' (G.C. Exh. 11 at 5.)

[90] Barlow, who began his career at TNS in 1978 as an operator, was promoted to the position of RSO in December 1979, after obtaining a master's degree in environmental health and attending a brief training program in health physics at Oakridge, Tennessee.

[91] Since Barlow and Hock worked during the day, I assume that employees on the evening and night shifts were not privy to their lectures. Innello testified that they did not meet with the maintenance staff on any shift.

Hock lectured about 3 different kinds of radioactive rays; that one type, the alpha ray, could not penetrate a piece of paper; that penetrating rays were bad but there was not much of this variety at TNS.[92] Hock's failure to make it absolutely clear that alpha particles pose a threat 20 times greater than beta or gamma rays if absorbed into the body and that alpha was the principal and prominent offender at TNS, was irresponsible, if not dangerous. Many employees recalled Hock stating that the amount of radioactivity at TNS was equivalent to a few X-rays a year, or no more than one would receive from being in the sun all day. Months later, employees learned from Dr. Mark Nelson that one X-ray typically exmits 15 to 20 millirems; far less than the 2.43 average annual dose received by the TNS work force in 1980. Other employees recalled that Barlow and Hock stated that such common household objects as televisions and microwave ovens emitted radiation. While it is true that radioactivity emanates from a variety of man-made devices, the employees were not informed that such emissions are at extremely low levels, far below those to which they were exposed at TNS. Further, the subject of risk acceptance was not discussed. Simply equating exposures to radiation from necessary and beneficial X-rays or radiotherapy obscures the important question of whether the employees should as readily accept the risks of negative consequences in a non-theraputic situation. It is apparent that the trainers failed to inform the employees that the impact of radioactivity on human tissue is cumulative so that it is important to limit exposures over background amounts or doses received for medical purposes to levels which are as low as reasonably achievable.

Education of the employees as to the toxic effects of exposure to DU also was not particularly helpful. For example, Barlow attempted to explain the Company's urinalysis notice and action limits for he told the employees that it was undesirable for their ''counts'' to exceed 50. However, Barlow did not explain what effects should be expected when those limits were exceeded or what precautions employees should take to avoid reaching them.[93] No management official ever told the workers that DU's heavy metal particles could poison their kidneys.

The results of the in-vivo lung tests also were shrouded in mystery. Once, when Rimel had to be retested, Barlow revealed the results of the lung test to her, but said that he was not supposed to have done so.[94]

The supervisors also suggested through their behavior on the shop floor that sound health practices could be ignored. Thus, the same foremen who read the prescribed script about the proper way to clean up greensalt spills, did not insist that those procedures be followed when spills actually happened. Foremen did not routinely insist that employees wear respirators when blowouts occurred, nor did they summon health and safety personnel to check the contamination levels when the blowout detritus had drifted away. Supervisors did not instruct employees to turn off their machines when ventilators were not working properly or when the filters were being changed. They did not prevent employees from sitting on derbies, or scouring smoldering mold assemblies and cylinders over unventilated grates without wearing respirators. Respondent adduced no evidence that any of the employees were reprimanded or otherwise disciplined for derelict conduct.[95]

The cavalier attitude of most of the supervisors, reinforced by the understatements delivered by the health and safety staff, conveyed to the employees the comforting message that there were no excessive hazards in the workplace. It is a truism to state that a training program can be no more effective than those who administer it. The need to have competent personnel to run the health and safety program at TNS was particularly important where the youthful, inexperienced work force was exposed to material whose dangers were latent and invisible.

Respondent's concern with the health and safety of its work force became more evident after the work stoppage. In May 1983, the Respondent employed as its RSO, Leslie Cole, a knowledgeable, Board-certified health physicist. With the health physics staff expanded to 8, there was coverage for every shift. Newly hired employees received a thorough medical examination, including a pulmonary function test which determined the individual's capacity to wear a respirator comfortably. A 4-hour orientation lecture devoted to health and safety was given together with a film slide presentation showing the sources and possible effects of radiation in the plant. In contrast to Barlow's lack of authority, the poststrike RSO was empowered to and occasionally did order a shutdown of operations when air quality exceeded 50 percent of MPC.

V. SCIENTIFIC EVIDENCE CONCERNING DANGERS AT TNS

Under the Supreme Court's *Gateway* holding, objective evidence is required to support the employees' good faith belief that abnormally dangerous working conditions existed. Pursuant to that requirement, the parties introduced scientific documents and adduced expert testimony on the question of whether the TNS employees confronted abnormal hazards. This evidence is reviewed below.

A. *The RMC Report*

As mentioned above, shortly after the strike began, Respondent commissioned RMC to audit its facility. The consultant responsible for this task, John Davis,[96] stated that the purpose of the report was to determine whether TNS was in compliance with State regulations and if not, to recommend measures to achieve compliance. At the end of his report,

[92] In Radiation and Human Health at 30, Dr. Gofman explains that alpha particles cannot pass through a piece of paper because they are so effective in damaging the chemical bonds in the sheet that they transfer all their energy to it. Therefore, rather than incorrectly assuming that alpha particles are weak because they can be halted by a single sheet, the correct conclusion is that alpha particles are very damaging if they invade human tissue.

[93] Barlow did suggest that employees drink beer to flush harmful substances from their kidneys. This was hardly sound advice given the relatively insoluble quality of the compounds at TNS.

[94] TNS posted a notice which announced that employees could see their test results, but most of them seemed unaware they had such a right.

[95] Respondent introduced evidence of four warnings given to Decker, three of which involved industrial safety infractions. Only one concerned a health violation—smoking a cigarette in a controlled zone of the plant.

[96] Davis holds a master's degree in health physics, is a certified health physicist, and has worked in the health physics field since 1960.

Davis framed his mission in a somewhat different manner, stating that Respondent had asked him to determine if its operations were hazardous, and to what degree. (G.C. Exh. 10 at 1, 9.)

Following a 2-day evaluation on May 13 and 14, 1981, the RMC report issued on May 29. It is a particularly probative document because it represents the work of a private, paid consultant whose candid findings and severe critique of the Respondent's health and safety program confirmed all of the employees' complaints.

Forewarned that the Union had claimed the TNS operations were hazardous because of the long-term use of respirators, the consultant focused considerable attention on air quality problems and Respondent's attempt to correct than by the compulsory use of respirators. Although his plant tour was brief, Davis had no difficulty in locating the sources of the contaminated air. He pointed out that the ventilation system was poorly designed; junctions in the duct work leaked, enclosures around the grinders were deficient and failed to contain the fine mists; ventilation collars on the mold assemblies did not effectively contain the dust; molds created a dust hazard when dumped on the floor to release the derbies; cross currents were suspected of interfering with proper ventilation at the downdraft table; the ventilation system improperly depended on opening and closing doors; and the ventilation system had no instruments attached to indicate drops in air flow. These deficiencies were among those the employees described during this proceeding.

The RMC consultant urged Respondent to correct its air quality problems by engineering methods and not by placing employees in respirators. Having chosen this less desirable course, Davis pointed out that Respondent could not assume that the masks provided adequate protection since management had failed to comply with regulatory requirements for an acceptable respiratory program.[97] In assessing Respondent's compliance with these requirements, the report specifically noted the following deficiencies: Respondent failed to maintain a policy statement regarding proper respirator usage; its medical surveillance program was inadequate; it had an inadequate employee training program; its program for assuring the proper fit, use, cleaning, storage, inspection, quality and maintenance of the equipment was below standard.

Mincing no words about the seriousness of the excessive respirator usage, and echoing comments which appeared in NUREG 0041 and in the DARCOM handbook, he cautioned: ''It is too much to expect a person to wear a respirator day in and day out without experiencing physiological and mental strains. Where this occurs, he tends to cheat on the wearing of masks.'' (G.C. Exh. 10 at 3.) Contrary to the Respondent's claim that the respirators served their purpose, Davis concluded that cheating must have occurred since ''bioassays did not drop as low as one would expect when plant personnel started to wear respirators.'' Id. Davis stated that respirators should be reserved for short-term or emergency situations and stressed the ''immediate need to correct the high airborne problem by engineering means.'' (G.C. Exh. 10 at 9.) Although Davis pointed out the urgency of the situation, he was advised that management did not plan to take corrective action until August when new equipment was supposed to be installed, a delay which in his opinion was untenable. Davis wrote: ''Months will be required before it (the new equipment) is in operation with no assurance that the airborne problem will be alleviated. Timewise this is not acceptable.'' (G.C. Exh. 10 at 9.) Had the strike not intervened, Respondent evidently expected to continue its mandatory respirator program until the new machinery for the penetrator shop arrived. The RMC report makes no mention of any plan to improve the air quality in the foundry, an area also afflicted with airborne contamination problems and where a number of employees also were required to wear respirators for prolonged periods of time.

Respondent claimed to TDRH and before the Gore Committee that its respirator program was an acceptable, short-term solution. This claim rings false when its own consultant condemned the program as being too oppresive and poorly managed to properly reduce exposures.

The RMC report also described other matters which fell short of desirable practice. For example, the consultant noted that there was ''a potential for large amounts of the th-234 (a beta emitter) to be present in the derby breakout area.'' Yet, Respondent had not conducted surveys for beta activity, ''assuming all th-234 activity is in equilibrium with the U-238 parent.'' (G.C. Exh. 10 at 2.) Davis obviously was concerned about the possibility of disequilibrium for he again referred to this matter in questioning the validity of Respondent's in-vivo test results. It does not stand to reason that Davis would express concern if the test results were likely to be lower rather than higher than those reported. Nevertheless, during trial, Respondent suggested that if there was an imbalance in the equilibrium between th-234 and U-238, the in-vivo lung scan results might be either lower or higher than those recorded.[98]

The report also pointed out that radiation survey meters and air flow devices on the air samplers were not calibrated as frequently as required by the TNS license. While such oversights do not prove beyond doubt that the survey results were incorrect, they cast great doubt on Respondent's commitment to accurate monitoring. Other deficiencies in the TNS health and safety program also were noted, but the report observed that in spite of the noted shortcomings, no discipline was imposed to enforce compliance with plant rules.

In the final analysis, the RMC report concluded that there were ''many areas of noncompliance. These coupled with the past history of whole body and extremity overexposure should be of great concern to management.'' (G.C. Exh. 10 at 9.) Davis did not place blame for the inadequate health and safety program on the front line supervisors although he believed they needed to be more involved in a special in depth training program; nor did he find fault with the health and safety staff whom he regarded as capable of improving the program. Rather, finding a ''lack of management commitment to a radiation safety program'' he held the plant management directly responsible, and urged them to support

[97] Davis commented that the respirators offered the requite PF. Since he did not observe the employees wearing the masks, he obviously was referring to the PF arbitrarily assigned to the type of mask used at TNS (assuming ideal conditions).

[98] Another scientist who testified in this proceeding, Dr. David Eagilman, suggested that the absence of data bearing on beta radiation activity at TNS was one of the unresolved mysteries in this case.

necessary changes and pay strict attention to radiation health and safety. (G.C. Exh. 10 at 4, 10.)[99]

B. *Dr. Morgan*

Dr. Karl Morgan, a pioneer in the health physics profession, former Director of the Health Physics Division at the Oakridge National Laboratory for 29 years, long-term editor-in-chief of the respected Journal of Health Physics, and distinguished author of numerous, frequently cited works on radiation and health physics, was well qualified to serve as an expert witness with regard to the properties and health effects of radiation. Given his familiarity with all aspects of health physics and a life time of scholarly achievement, his explanation of the biologic affects of absorbed doses of ionizing radiation was particularly instructive.[100]

Concurring in the position taken by the ICRP as well as most other respected scientific bodies, Dr. Morgan subscribed to the linear, no-threshold concept of radiation risk. He further explained that deposited alpha particles which remain in human tissue throughout their lengthy half-life will continue to irradiate cells even if no further exposure occurs. Therefore, when a worker is transferred to a less contaminated worksite, further exposure may be reduced, but adverse effects from the dose already received will be unaffected. Dr. Morgan emphasized that the sole way to reduce such risk is by preventing exposure in the first place.

After reviewing Respondent's air and personnel monitoring data, Dr. Morgan was skeptical that the Company's records accurately reported the quantity of airborne contamination in the plant. In his opinion, some areas had to be far more dusty than the records indicated to account for the employees' high uranium-in-urine exposures. He further indicated that TNS could not have evaluated the data it collected, for had it done so, the need to take appropriate action to reduce the high exposure levels would have been obvious. The urinalysis data alone was enough to convince him that conditions at TNS were abnormally dangerous and that corrective action was too slow in coming.

Dr. Morgan also offered evidence as to the probability that the striking employees would develop cancer as a result of their exposure to depleted uranium at TNS. No evidence presented in this hearing generated more controversy than did the Doctor's dose and probability tables. (See G.C. Exhs. 8(a) and 95.)

Starting with the 1981 urinalysis data,[101] Dr. Morgan worked through a chain of intricate equations (a process known as ''back calculation'') to determine the radiation dose delivered to the organs of 23 selected workers.[102]

For his calculations, he relied principally on algebraic formulae contained in the report of ICRP Committee 2[103] which express in mathematic terms the biologic odyssey of uranium particles as they travel from the lung via the bloodstream to various parts of the body of a ''Standard Man;'' that is, a theoretical model of an adult human with fixed anatomic and physiologic proportions.[104]

In the absence of concrete information about the size and solubility characteristics of the radioactive compounds at TNS, Dr. Morgan assumed a standard particle size distribution. Accurate information about such matters is crucial in determining the extent to which particles are retained in the three stylized compartments of the Reference Man's lungs and the rate at which the particles are transported to other areas of the body. The smaller the particle size, the more the particle will be entrapped in the deepest region of the lung and the less likely to be expelled or removed by metabolic action.

Solubility, which pertains to the dissolution of chemical compounds in body fluids, determines in part the rate at which the inhaled or ingested particles are tranferred from the lung to other body zones. The more soluble particles are cleared from the lungs relatively quickly and thus, have less time to irradiate the tissue there. Conversely, insoluble material lingers longer in the lungs and thereby has greater opportunity to do harm. Therefore, Dr. Morgan's decision to categorize the compounds at TNS as highly insoluble determined in large measure the equations used to describe the amount, route and length of time the absorbed alpha particles took to clear the lung and travel to selected zones in the bodies of the 23 workers.

---

[99] The RMC report is an unsparing appraisal of flaws in the TNS health and safety program. Shortly after the report was completed, management officials consulted with Davis on several occasions. Then, after Davis left RMC, Respondent employed him as a private consultant and met with him on three dates in the spring and summer of 1983. By the time he appeared as a witness in this proceeding, the candor which marked his written work was less apparent. His testimony often was vague, evasive and equivocal. For example, Davis thought it relevant and important to state in the RMC report that Respondent had failed to follow Reg. Guide 8.15 and NUREG 0041. However, at the hearing several years later, he attempted to minimize the significance of the NRC guidelines, referring to them as ''only recommendations.'' (Tr. 1110–1112.) In his testimony, he attempted to soften other comments in the report such as the ''lack of management commitment to a radiation safety program'' explaining that he was referring only to Respondent's failure to provide written documentation. That explanation of such a damning comment is unconvincing, for surely TNS could have provided the needed written materials if Davis had requested them. A fair reading of the RMC report leads to the conclusion that his criticism addressed more than a mere lack of paper. In short, I find Davis' written words, prepared without anticipation of litigation, far more reliable than his testimony at this hearing.

[100] At this hearing, Dr. Morgan explained many of the fundamental scientific principles which are included in the background portions of the *Allen v. U.S.* decision.

[101] Dr. Morgan relied on the more complete TNS urinalysis records rather than the in-vivo lung scan data, which, although directly measuring radiation doses to the lung, may have reflected as much as a 20-percent margin of error if the U-238 and TH-234 were not in equilbrium (as Davis suspected.)

[102] Dr. Morgan selected at random a group of 23 employees, listed seriatim in G.C. Exh. 4, assuming that they would constitute a representative sampling of the work force.

[103] Dr. Morgan chaired the Committee which published ICRP Report 2 in 1959. As more scientific data became available, ICRP 2 was revised and reissued in 1979 in ICRP Publication 30. The ultimate purpose of ICRP 30 was to recommend annual limits on radionuclide intake (ALI) and air concentrations (DAC) for each organ to prevent stochastic effects; i.e., ''malignant and hereditary disease for which the probability of an effect occurring, rather than its severity, is regarded as a function of dose without threshold . . . .'' (R. Exh. 472 at 5.)

[104] In ICRP 30, the term ''Reference Man'' supplanted ''Standard Man.''

Dr. Morgan began by totaling and averaging the actual urinanlysis values received by each of the 23 employees during the first quarter of 1981. Using these averages, he then calculated backward to compute the uranium doses delivered to the lung, colon, kidney, and bone of the selected workers in 1 year and 30 years (assuming the 1981 average dose remained constant). In the next step, Dr. Morgan referred to cancer co-efficients; that is, estimates of the risk of cancer for each rem of radiation received to specific organs, provided in a report of the BEIR III Committee, to derive two sets of probability tables.[105] The first set of tables (P1) showed that if cancer was already diagnosed, what the probability would be (expressed as a percentage) that the cancer was caused by the dose to that worker's organ which he received at TNS. The second table (P2) predicted what the probability would be that each of the 23 workers would develop cancer given the calculated dose to each of the four organs under study. (See G.C. Exh. 8a.)[106]

Dr. Morgan's computations showed that in every instance, the lung was at greatest risk from radioactivity. Specifically, the tables showed that each of the 23 employees listed received an estimated 1 year dose to the lung of over 1000 rems. According to the P^1 tables, it followed that if these individuals developed lung cancer, the probability was no less than 99 percent (in all but one case) that the cancer was caused by exposure to radioactivity at TNS.

Two of Respondent's expert witnesses, Leslie Cole and Dr. John Auxier, took strong exception to Dr. Morgan's methodology, contending that he made a number of erroneous assumptions which led to false and exaggerated results. They maintained that the first mistake was his reliance on the process of back calculating from excretion to intake to determine internal radiation doses. Since TNS maintained direct lung dose measurements, they saw no reason to use artificial estimated calculations. At an earlier time, Respondent made the same argument to TDRH; yet, although the Department knew that the Company conducted in-vivo tests which yielded lung doses, it nevertheless exhorted Respondent to perform back calculations. (See G.C. Exh. 76a at 5.) TDRH's communications to TNS revealed that it questioned the numerical values assigned to the in-vivo tests and regarded back calculations as a sound alternative approach to assessing the employees' lung burden.[107]

Respondent's experts also objected to Dr. Morgan's assumption that the radioactive material at TNS was highly insoluble, a classification which they claimed was not only outmoded but also produced inflated results.

They correctly pointed out that ICRP 30 abandoned the ICRP 2 ''soluble-insoluble categories,'' and replaced them with the following three classifications to better describe the rate at which radioactive materials are transported from the stylized compartments of the Reference Man's lung to the other parts of the body via the bloodstream: category ''D'' applies to highly soluble substances, one-half of which are removed from the lung in less than 10 days; category ''W'' represents relatively insoluble substances with a removal time of 10 to 100 days, and category ''Y'' reflects highly insoluble materials with the removal time of greater than 100 days. The ''Y'' classification is similar to but not identical with the insoluble category selected by Dr. Morgan.

Cole asserted that if Dr. Morgan had applied the ''W'' classification, which NIOSH chose as the appropriate category to describe the biologic transportability of radioactive substances at TNS, his tables would have reflected more modest results. It is true that NIOSH assumed that the ''W'' category applied to the compounds at TNS, but not because it had special knowledge about the exact properties of the material there. Rather, in the absence of scientific verification, NIOSH simply made an assumption, as did Dr. Morgan, about the soluble properties of the contaminants at the plant.

In fact, ICRP 30 supports the view that while the ''W'' category may be appropriate to describe a portion of the radioactive material at TNS, the ''Y'' classification may be an equally if not more accurate category for some of the other radioactive compounds there. Thus, while ICRP 30 assigns greensalt to the relatively insoluble W category, U_3O^8, a uranium oxide, and the most prevalent compound at TNS, falls within the highly insoluble ''Y'' category. (R. Exh. 472 at 102.) Accordingly, Dr. Morgan had good reason to assume that the radioactive substances at TNS were highly insoluble, although he failed to express that assumption with the mathematical equations associated with the ''Y'' classification.[108]

Respondent's experts criticized other aspects of Dr. Morgan's methodology which they claim also contributed to his grossly inflated doses and excessive probability tables. Common sense, rather than perfect comprehension of higher mathematics compels me to conclude that Dr. Morgan's calculations produced questionable results, at least for the lung burdens. For example, Dr. Morgan estimated that employees Lenoir, Reed, Richardson, and Rimel (among others), received lung doses of over 1000 rems in 1 year. Doses of such magnitude are considered acute and surely would cause noticeably severe if not lethal effects in fairly short order. Yet, each of the above-named employees testified at this hearing with no apparent respiratory impairment. In fact,

[105] The Advisory Committee on the Biologic Effects of Ionizing Radiation, popularly known as the BEIR Committee, published a report, *The Effects on Population of Exposure to Low Levels of Ionizing Radiation* in 1980 under the auspices of the National Research Council. The BEIR risk estimates are based entirely on Hiroshima-Nagasaki data. However, the BEIR III report does not take into account followup studies of the Japanese atom bomb survivors. As Dr. Morgan explained, and as most scientists agree, those recent studies have demonstrated that the effect of high-LET radiation is greater than previously believed, at least by a factor of 2. Accordingly, in calculating the probability of radiation induced cancer over 30 years, in both his P^1 and P^2 tables, Dr. Morgan doubled the risk estimates set forth in the BEIR III report.

[106] When Dr. Morgan resumed the witness stand on the second day of his appearance in this proceeding, he acknowledged that he had made a mathematical error in his computations. The corrected calculations appear in the record as G.C. Exh. 8a. The error which Dr. Morgan detected made no significant change in the calculated doses or probability of cancer incidence to the lung.

[107] The NIOSH report supports TDRH's position that the Helgerson Company which evaluated the lung scans for TNS, used a standard which underestimated the results.

[108] In a February 1982 study of a machinist who was overexposed to DU while working at a Massachusetts plant which, like TNS, manufactured derbies, Dr. John Hursh, the NRC consultant, assumed that ''Y'' was the proper classification in calculating the lung dose. (See R. Exh. 433 at 14.)

Brad Richardson, one of the former strikers who was recalled to work at TNS in 1983, had a medical examination prior to his reemployment which disclosed no evidence of observable respiratory malfunction.[109] These implausible lung dose estimates cast doubt on the validity of the balance of the results in General Counsel's Exhibit 8(a). Consequently, I shall not rely on these tables as probative evidence in this case.

C. *Leslie Cole*

In an effort to demonstrate the invalidity of Dr. Morgan's tables, Leslie Cole, Respondent's RSO,[110] designed a computer program which adopted the Doctor's mathematical processes, but substituted what Cole claimed were more appropriate assumptions and equations. Respondent submits that Cole's calculations, which resulted in doses and probabilities of cancer several orders of magnitude smaller than those derived by Dr. Morgan, are more reliable than those which appear in G.C. Exh. 8a. On cross-examination, Cole acknowledged that several errors flawed his program. These errors may account in part for the considerably lower dosages and probability figures than those produced by Dr. Morgan. In addition, Cole's results also differed from Dr. Morgan's because he chose fractions associated with ''Class W'' material, although as discussed above, it is reasonable to conclude that ''W'' is not the most suitable or at least not the sole category for much of the radioactive material at TNS. Further, Cole erred in assuming that one of the lung compartments in the ICRP 30 model of the ''Reference Man'' transferred radioactive particles to the blood. Cole conceded that if he was mistaken about the proper function of the questioned compartment, his calculated lung doses would increase by approximately 70 percent, even assuming class W material. Consequently, Cole's first set of assumptions and miscalculations led to results which were no less distorted that those of Dr. Morgan. Therefore, I am constrained to discount Respondent's Exhibit 459 and other documents which were generated by Cole's original computer program.

At the General Counsel's request on cross examination, Cole factored into his computer program, equations appropriate to the ''Y'' solubility classification. He then retrieved new dose data which I am persuaded is based on sound assumptions and produced more reliable results than either his or Dr. Morgan's original computations.

Cole's revised data showed that an individual with a lung dose of 15 rems would register a corresponding 25.4 micrograms of uranium to each liter of urine. (Compare G.C. Exh. 93 with R. Exh. 452.) Using ''Y'' category equations, Cole then recalculated the lung dose received by three employees—Numbers 1, 13, and 14—with the following results (G.C. Exh. 93 at 4):

Employee	*Uranium in Urine (ug/l)*	*Rems to the Lung in Rems*
1	23.7	14
13	99.8	59
14	46.9	27.7

The parties agree that 9 of the 23 employees studied had uranium-in-urine levels in excess of 27.3 ug/l.[111] It follows that 39 percent of the study sample (9 of 23) sustained estimated lung burdens in excess of the recommended 15 rem maximum dose. Since the employees included in Dr. Morgan's and Cole's study were randomly selected, it is reasonable to conclude that a similar percentage (39 percent) of the rest of the work force received estimated lung burdens in excess of the maximum.[112]

While I recognize that the process of back calculations is complex, that certain theoretical assumptions were factored into the equations, and that the ICRP 30 standardized mathematical model may not exactly fit to TNS employees who differ physically from the Reference Man, I am persuaded, nevertheless, that Cole's corrected lung dose calculations were reasonably accurate and that his revised table offers additional proof that TNS employees were exposed to excessive radiation beyond that which may be deemed an acceptable risk.

D. *Dr. Auxier*

Dr. John Auxier succeeded Dr. Morgan as President of the Applied Science Laboratory in Oakridge, Tennessee. He headed a research team that studied radiation effects among the Hiroshima and Nakasaki survivors, was a former President of the Health Physics Society and author of many learned treatises. These credentials, no less impressive than those of Dr. Morgan, attest to Dr. Auxier's eminence as a scientist and health physicist. Called as an expert witness by Respondent, his testimony regarding basic concepts of ionizing radiation were enlightening and in many respects, consistent with those offered by Dr. Morgan.

Dr. Auxier's differences with Dr. Morgan about fundamental scientific principles primarily involved matters of interpretation or emphasis. For example, both scientists subscribed to the linear-no-threshold theory. However, Dr. Morgan joined a minority of scientists who agree that under certain circumstances, a supralinear theory is valid; whereas Dr.

[109] Caveat: one should not imply that proof that cancer actually will occur is necessary to establish that working conditions were abnormally dangerous. See part III,I,A, infra.

[110] Cole was employed as RSO at TNS in May 1983. He has a M.S. degree in chemistry and is working toward a Ph.D. He also is a certified health physicist and has had extensive experience in the health physics field.

[111] In addition to employees 13 and 14 charted above, the following numbered employees had estimated uranium-in-urine averages (ug/l) in 1981 (first quarter) in amounts which would lead to derived lung burdens in excess of the 15 rem maximum dose:

Employee No.	*Avg. ug/l*
2	44
8	32.4
9	59
16	43.9
18	38.6
19	25.5
23	36.3

Employees number 7, 11, and 21 had uranium-in-urine averages which would translate into lung burdens slightly less than the 15 rem limit.

[112] This reasoning rests on the assumption that the employees' 1981 first quarter urinalysis averages were constant for the year, and that the Y classification was appropriate.

Auxier was among another group which endorses a linear-quadratic theory at low, beta radiation levels.[113] Further, Dr. Morgan did not regard regulatory ceilngs as sufficiently rigorous to protect employees adequately. Dr. Auxier, on the other hand, considered regulatory standards as overly protective. In Dr. Auxier's opinion, administrative bodies such as the NRC imposed more rigorous radiation standards not out of necessity, but out of excessive zeal, and a confidence that the nuclear industries could comply. Of course, Dr. Auxier was well aware that the NRC and TDRH standards were predicated on the research studies of eminent scientific organizations. Therefore, his contention that governmental agencies revised acceptable radiation doses for want of anything better to do was an unjustified attack on the regulatory process.

With Cole, Dr. Auxier strongly excepted to Dr. Morgan's dose and probability tables and regarded the back calculation process as inherently flawed. Without waiving his objection to the process, Dr. Auxier examined Cole's assumptions and mathematics and pronounced them correct. Based on his review of Cole's analysis, Dr. Auxier concluded that the TNS employees had not suffered any damage to their health. In so finding, Dr. Auxier placed his imprimatur on work which Cole subsequently conceded was flawed. Further, Dr. Auxier endorsed Cole's choice of ''W'' as the proper classification for the radioactive substances at TNS, assuming that NIOSH had selected that class based on scientific study. Dr. Auxier was mistaken in this regard, for, as previously noted, NIOSH expressly disclaimed performing such a study.

Dr. Auxier also erred in suggesting that Evelyn Rimel's in-vivo test results proved the applicability of the W category. On September 5, 1980, 5 months after she was hired by Respondent, Rimel's first in-vivo test result was 29.6 mg., or 59.7 percent of the regulatory limit (assuming an alpha quality factor of only 10). Thereafter, Rimel was placed on work restriction. Her next lung scan on March 30, 1981n dropped to 7.5 mg. Dr. Auxier stated that this sharp reduction within what he believed to be 120 days demonstrated that the contaminant involved was a W class substance. In reality, the hiatus between Rimel's September and March in-vivo tests was more than 180 days, thereby undermining Dr. Auxier's analysis and implicating Y class dust.

Since Dr. Auxier's approval of Cole's dose and probability tables was founded on inaccurate assumptions, I cannot give any weight to his favorable opinion of Cole's original work or to his conclusion that the TNS strikers did not confront abnormal hazards.

Dr. Auxier concluded from his examination of the TNS exposure records, including lung readings and urinalysis data, that the TNS employees were not subjected to abnormally dangerous working conditions. He apparently reviewed and relied on the Helgerson lung scans, which NIOSH found underestimated the correct lung values by 100 percent. His assessment of the TNS urinalysis data also rested on his belief that the NRC proposed Reg. Guide 8.22 was an inappropriate standard which lacked scientific validity. However, this belief was not justified for that standard has since been reissued with additional scientific data supporting its validity. Of course, at the time Dr. Auxier testified, he may not have known of these new scientific studies or that the standards would be reissued.

[113] Stated simply, the supra/linear dose-response model postulates a greater cancer risk at low doses, whereas the linear-quadratic model assumes that the risk at low doses is less than that which would be derived from the linear model alone.

E. *Dr. Lushbaugh*

Respondent also presented another prominent scientist, Dr. Clarence Lushbaugh, who at the time of the hearing was Chairman of the Medical and Science Division at the Oakridge Associated Universities (ORAU) Director of the Center for the Radiation Accident Preparedness Center of the World Health Organization, and Professor of Epidemiology at the University of North Carolina (UNC).

Doctor Lushbaugh viewed the evidence bearing on the health effects of uranium from an extremely parochial perspective. On direct examination, he stated with authority that no scientific evidence existed which showed that chronic, low level exposure to uranium dust was associated with disease. He cited one study of 18,000 workers who were occupationally exposed to elevated levels of airborne uranium between 1943 and 1947[114] which showed a statistically significant increase in mortality rates due to radiation-induced lung cancer, but noted that it applied only to those who were 45 years or older at their date of hire. Dr. Lushbaugh specifically stated that the study revealed no significant incidence of cancer in persons in a younger age group.

Dr. Lushbaugh disagreed with other experts in this case as well as with virtually all scientific bodies with respect to the linear hypothesis. He rejected it because of what he alleged was a dearth of evidence relating to adverse health effects from low level uranium doses. Instead, he asserted that a radiation threshold did exist below which no biologic injury would occur. Dr. Lushbaugh also maintained that exposure limits such as the 5-rem whole body standard and the 15 rem lung dose were set conservatively for political and protective reasons but were not medically significant. Accordingly, Dr. Lushbaugh did not regard Rimel's and Garvin's 1980 lung doses, which were 119 and 190 percent respectively of the maximum permissible body burden, as cause for medical concern.[115]

Dr. Lushbaugh also testified that he knew of no research relating chronic low level uranium exposure to kidney damage. The studies with which he said he was familiar showed that at very high uranium doses—over 1000 mg. per liter of urine—the kidney recovers from transient damage and develops a tolerance to further uranium insults. Therefore, in light of the large amount of uranium needed to produce reparable injury, he viewed the NRC proposed uranium-in-urine limit of 30 ug/l as exceedingly inflated. Based on his review of the medical records of former strikers who received physical examinations prior to reinstatement at TNS, Dr. Lushbaugh found no clinically observable evidence of renal insult.

Dr. Lushbaugh's assertion that no research existed which casually connected uranium exposures to biologic harm was

[114] This research is generally referred to as the Polednick and Fromme study, titled after the scientists responsible for the research.

[115] Rimel's and Carter's lung burdens were reported by the Helgerson Company as 59.7 and 94.7 percent of MPBB, or one-half of the burden if alpha was assigned a quality factor of 10 rather than 20. Dr. Lushbaugh disapproved of assigning a quality factor of 20 to alpha rems.

wrong and misleading. He was well aware of an array of current studies in progress which would contradict this assertion. Not until confronted with documented proof on cross-examination did he acknowledge that epidemiological research, conducted under his direction, was linking cancers, leukemia and respiratory disease to low level uranium exposures. (See G.C. Exh. 94.)

As project director, Dr. Lushbaugh obviously was aware that ORAU and UNC scientists were engaged in major epidemiological studies of health and mortality effects among U.S. Department of Energy (DOE) workers occupationally exposed to uranium. In May 1984, shortly before his first appearance in the instant proceeding, Dr. Lushbaugh attended a DOE seminar at which reports were presented of preliminary findings from each project in the overall study. While some of the projects were in their early stages, others were near completion.[116] For example, the Polednick and Fromme study of 18,000 workers which Dr. Lushbaugh previously said showed positive findings only for workers over age 45, had been updated and showed ''significant excessive deaths from lung cancer when compared to U.S. white male rates'' regardless of age.

Another report which was then about to be published as the doctoral dissertation of Dr. James Wilson, involved 4000 workers at a uranium plant in Fernald, Ohio, many of whom were engaged in tasks similar to those performed at TNS. No evidence was presented as to the exact doses received by the Fernald employees or to the length of their employment. The project summary stated that Dr. Wilson found ''an association between exposure to uranium and the development of non-malignant respiratory disease events.'' In a separate study of the Fernald workers, Dr. Wilson found a 36-percent excess of digestive cancers, but did not regard that as statistically significant.[117] In addition, for workers 36 or older at the time of hire, an elevated number of deaths from digestive cancers was statistically significant; enough to attribute it positively to uranium exposure.

Another study, which found a significant increase of cancers among maintenance and janitorial workers at the Oakridge National Laboratory, suggested that the overall risk appeared to follow a linear model. Still in an initial phase, yet another research project, involving 2500 male employees exposed to less than 5 rems between 1947 and 1978, revealed that the standard mortality rate was 1.04 with a significantly elevated death rate for rectal cancer.[118]

When questioned by the General Counsel, Dr. Lushbaugh rationalized his earlier failure to refer to these studies by suggesting either that the research was incomplete, that some of the work had not been submitted for peer review and formally published, or had not been corrected to factor in the effects of smoking on the exposed participants. While caution and skepticism generally are the hallmarks of a sound scientific approach, Dr. Lushbaugh's reservations stretched these qualities beyond recognition. He was in a unique position to assist the Board and the parties in this case by describing these studies. He could easily have qualified his remarks by explaining which of the studies if any, were too preliminary to be reliable rather than withholding information about them altogether until concealment became impossible. When he said there were no studies showing the radioactive effects of low-level uranium exposures, he was wrong. If he believed that some studies were still inconclusive or that the data could not yet be deemed statistically significant, he could have so stated. His failure to acknowledge the existence of scientific work which tends to contradict his own views has disturbing implications. It is distressing that an eminent scientist should fail voluntarily to disclose mounting evidence that workers exposed to low-level doses of uranium are at grave risk.

Dr. Lushbaugh also reluctantly conceded on cross-examination that his comments regarding the reversible effects of heavy uranium metal on the kidney and the tolerance effect subsequently produced, arise only when the doses are substantial.[119] He could hardly disagree with the findings set forth in one of the most comprehensive and authoritative treatises on this subject:

> In order to produce tolerance it was found that the conditioning doses be high enough to produce some kidney injury. However, it cannot be assumed that chronic exposure of uranium workers will produce the same tolerance so that the daily dose for such workers must be regulated so that even transient injury will not occur.''[120]

F. *Dr. Eagilman*

Other aspects of Dr. Lushbaugh's testimony were soundly rebutted by Dr. David Eagilman, a scientist specializing in the analysis and treatment of occupationally related diseases. After reading Dr. Lushbaugh's testimony and reviewing the same employee records of the reinstated strikers, Dr. Eagilman took issue with Dr. Lushbaugh's conclusion that the reemployment records of individual employees showed no evidence of kidney damage.

Dr. Lushbaugh's opinion was based on the employees' normal creatinine levels and on the absence of albumin traces which appear in the urine when there is acute injury. However, as Dr. Eagilman explained without controversion, creatinine may register within normal ranges even when one-

[116] The hypothesis to be proved or disproved in each study was stated negatively as a ''null hypothesis.'' For example, in research updating the Polednick and Fromme study, the null hypothesis was framed in the following terms: ''No association between working in areas where the average air levels of uranium dust was high and increased mortality.'' (G.C. Exh. 94 at 2 -1.) Each ORAU/UNC study which reported results beyond the preliminary stage negated the null hypothesis. In other words, some degree of statistically significant correlation was found between uranium exposure and biologic effect (leukemia, cancers or respiratory disease) in each study with reportable results.

[117] To find no statistical significance merely means that there was more than a 1 in 20 chance that the increased incidence might be attributed to a cause other than uranium exposure. The absence of statistical significance does not necessarily cast a 36 percent increase into insignificant obscurity from an evidentiary point of view.

[118] The workers included in this study received an average total dose of 20 rems over 3-1/2 working years. This would amount to 1.4 rems annually per worker or 1 rem less than the average dose received by the TNS prestrike work force.

[119] He also did not disclose that the studies he cited had followed the subjects for only a year or two. Hence, the possibility of latent effects never was considered.

[120] C. Voegtlin and H. C. Hodge eds., Pharmacology and Toxicology of Uranium Compounds, Vol. 1-2 (1949); Vol. III and IV (1953)).

half to one-third of the kidney function is lost. Therefore, in order to detect early renal damage to the tubules (the site in the kidneys where chemically toxic damage first appears) far more sensitive tests must be performed than those which provided the basis for Dr. Lushbaugh's conclusion. For example, Dr. Eagilman stated, as had Dr. Nelson, that the 24-hour creatinine clearance test was a more subtle diagnostic tool. He suggested that other sophisticated tests also should have been performed to search urine specimens for elevated levels of amino acids or a small protein known as beta microglobulin - 2. The TNS employees did not have the benefit of such analyses.[121] Dr. Eagilman was convinced that without the insight such tests could provide, Dr. Lushbaugh did not have any data on which to base an informed judgment about the possibility of early renal damage to the kidneys of the TNS employees.[122]

In stressing the significance of the beta 2 microglobulin as an early index of kidney dysfunction, Dr. Eagilman drew on a NIOSH study concerning renal damage from prolonged exposure to low levels of uranium to workers at the Cotter Uranium Mill in Colorado.[123] In the Cotter Mill study NIOSH explained that when the renal tubule is damaged, increased amounts of beta 2 microglobulin appear in the urine. NIOSH then reported that significant ''statistically increased urinary excretion of amino acid and of the small protein beta-2-microglobulin'' appeared in the urine of the Cotter Mill workers. ''These findings are suggestive of renal (kidney) tubule injury, and are consistent with the known toxic effect of soluble uranium on the kidney tubules.'' (I. Exh. at 2.)[124] The NIOSH report concluded unequivocally that ''a health hazard from excessive exposure to soluble uranium existed among the Cotter Mill employees studied. (Id. at 3.)

In reaching this conclusion, the NIOSH study found that 21.5 percent of the 1975–1978 uranium-in-urine samples from the Cotter Mill workers ''exceeded the present limiting value of 30 micrograms per liter which was established to protect against chemical toxicity in the kidney.'' (Id. at 2.)[125]

Dr. Eagilman observed that the doses received by the TNS employees were far greater than those of the Cotter Mill workers. Specifically, 50 percent of Respondent's work force exceeded the Reg. Guide 15 ug/l notice level; 13 percent exceeded the DARCOM 50 ug/l notice level and 3.6 percent surpassed the DARCOM action level of 100 ug/l. Further, the mean uranium-in-urine level among Cotter Mill employees was 13.6 ug/l. At TNS, it was higher—20 ug/l. In addition, Dr. Eagilman inferred that since insoluble uranium is less easily absorbed than the soluble yellowcake uranium at Cotter Mill, the amount of contaminated dust at TNS had to be enormous in order to explain the much higher exposures of the employees there. Dr. Eagilman also concluded that excessive exposures were widespread at TNS in that 52 percent of the workers registered urine specimens over 50 ug/l at some time, while another 20 percent had at least one sample of at least 100 ug/l.

At doses lower than those reported for the TNS workers, the Cotter Mill employees all sustained renal tubular injury.[126] Since the TNS employees' exposures were greater than those at Cotter Mill, Dr. Eagilman concluded with reasonable medical certainty that if the TNS employees had continued to receive doses at the same levels which they had sustained prior to the strike, they would have suffered tubular damage and renal disease.

Dr. Eagilman also excepted to Dr. Lushbaugh's view that the 2.43 rem average exposure for the TNS work force was of no medical concern. He was of the view that it was a matter of serious concern.[127] Dr. Eagilman stated that in order to understand why 2.43 rems average exposure was troublesome, even though it fell below the 5 rem maximum for nuclear workers, it was necessary to understand the concept of ''average exposure'' and how it differed from an individual, single high exposure. He explained that ICRP Publication 26 recommended 0.5 rems (not 5 rems) per year as the allowable ''average'' radiation exposure for workers since doses at this low level would produce a health risk no greater than that born by workers in safe industries. In order to achieve 0.5 rems as the average dose, the maximum allowable dose has to be set at 5 rems annually with the expectation that very few individuals would approach that limit. In endorsing .5 rems as an appropriate standard for an ''average risk,'' the ICRP observed that where an annual dose of 5 rems had been applied, ''the distribution of the annual dose . . . in large occupational groups has been shown very commonly to

[121] No such analysis was performed of the employee's urine samples studied in R. Exh. 433 either. Moreover, in evaluating the risk of kidney damage to this recently hired worker, the NRC consultant assumed that his few high-level uranium specimens resulted from single acute exposures and that ''D'' was the appropriate solubility classification for the dose to the kidney. Accordingly, Dr. Hursh calculated kidney dose estimates and reached conclusions which cannot be compared fairly with the TNS employees' long-term, chronic exposures to class Y or W compounds. It also is important to note that Dr. Hursh was concerned with determining whether the employee's exposure produced kidney injury in fact, a determination which is not relevant here.

[122] Dr. Lushbaugh also opined that the death in 1981 of former employee Albert Patton, from leukemia was not caused by the radiation dose he received at TNS. Although it is impossible to state with certainty that Patton's leukemia was causally related to his employement, neither is it possible to rule out such a possibility. Dr. Lushbaugh gave no reason for concluding with such certainty that Patton's leukemia was not work-related.

[123] Although the participants in the Cotter Mill study were engaged in converting raw uranium ore to yellowcake, a soluble uranium compound, the chemically toxic properties of uranium metal on the kidneys' tubules are thesame regardless of the isotopic differences between the compounds at Cotter Mill and those at TNS.

[124] Respondent apparently misread the NIOSH report in arguing that the B-2 concentrations for uranium workers were not significantly higher than those of the control group. NIOSH found just the reverse to be true (see I. Exh. 2 at 27–28). Respondent also erred in confusing individual beta-2 microglobulin readings which did not exceed normal limits with ''group findings and the observed dose-effect relationship'' which, strongly suggested to NIOSH ''tubular toxicity associated with uranium exposure'' (emphasis supplied). (Id. at 28.)

[125] NIOSH, of course, was referring to the action level proposed in Reg. Guide 8.22.

[126] Contrary to expectation, serum creatinine was higher and creatinine clearance lower among the controlled group than among the Cotter Mill uranium workers. The NIOSH report explained that this anomaly might be due to the fact that the cohort was composed of machine operators while the control group included laborers whose increased physical activity would account for the greater production of serum creatinine.

[127] Dr. Nelson expressed a similar concern.

fit . . . an arithmetic mean of about . . . (.5 rems) with very few values approaching the limit.''[128]

ICRP 26 provides the following unassailable authority for Dr. Eagilman's explanation that the 5 rem ceiling was set with the expectation that nuclear workers would run no more than a .5 rem average risk:

> for the foreseeable future a valid method for judging the acceptability of the level of risks in radiation workers is by comparing this risk with that for other occupations recognized as having high standards of safety which are generally considered to be those in which the average annual mortality due to occupational hazards does not exceeed . . . one in ten to the minus four. (Id. at 20)

The DARCOM handbook, like ICRP 26, states ''that radiation doses from DU are expected to be less than 10 percent of the legal limits for whole body and skin dose.'' (Quoted in G.C. Exh. 30 at 11.) In addition, NIOSH noted that ''most workers in other parts of the uranium fuel cycle . . . averaged 0.24 rem or less . . . with over 90 percent of workers receiving doses less than 0.50 rems.'' Id. Thus, the ICRP expectation that very few workers would approach the limit was, by and large, fulfilled in the nuclear industry, with TNS being a notable exception.

Given the average TNS employee exposure of 2.43 rems, it follows that the average risk of cancer from radiation at TNS was almost 5 times higher than the .5 rem risk level proposed by the ICRP. Dr. Eagilman further noted that employee exposures at TNS prior to the work stoppage were 5 to 10 times greater than those sustained by all other workers in the nuclear industry, and were unprecedented compared to uranium workers worldwide.[129] In his view, conditions at TNS were growing worse in the years prior to the strike, since the percentage of employees exposed to rising radiation doses increased between 1978 and 1980. This trend led him to infer that the Respondent was disregarding health risks to its personnel. Based on his review of the relevant materials, Dr. Eagilman concluded that working conditions at TNS were abnormally dangerous and that continued uranium exposures to the employees at prestrike levels ''would lead to death and disease . . . to increased mutation, miscarriages, and effects on their progeny.'' (Tr. 12078, 79.)

Respondent submits that in light of Dr. Lushbaugh's extensive experience, his testimony should be credited over Dr. Eagilman's. Dr. Lushbaugh's credentials admittedly are impressive but they do not help to salvage his testimony which was flawed by its omissions and refuted by more cogent analysis and uncontested facts marshalled by a scientist much his junior in years, but not in acumen. Dr. Lushbaugh was willing to discount epidemiological data which tended to show a causal connection between low level radiation exposures and disease. This was not careful, accurate scientific reportage. If the ORAU-UNC studies were not final, then a truly disinterested expert testifying with scrupulous objectivity, could and should have indicated what degree of scientific uncertainty attached to them. From an evidentiary point of view, limitations on the ORAU-UNC epidemiological projects may affect the weight accorded to them, but do not negate their relevance in this proceeding or in scientific annals. By treating these studies first as if they did not exist, and then as incomplete, and by refusing to extrapolate from them, Dr. Lushbaugh was willing to conclude that TNS workers faced no health risks from radiation. Yet, proliferating evidence lay at his fingertips suggesting that continued exposure to low level radiation could jeopardize the health of the TNS work force. Dr. Lushbaugh declared employees free of renal injury without appropriate medical support for his opinion. Given these breaches, I cannot trust his judgment and do not share his confidence that the TNS employees had no reason for medical concern about the prospect of disease or death from their occupational exposure to DU.

G. *TDRH Inspections*

From 1979 onward, TDRH inspected TNS semiannually, a schedule reserved for licencees requiring the greatest oversight. The TDRH internal memoranda and extensive correspondence with the Respondent, offers a useful, contemporaneous record of health conditions at TNS, untouched by faded memory or adversarial interest.

1. The September 1979 inspection

By letter dated November 12, 1979, TDRH cited Respondent for 16 violations detected during an inspection conducted the previous September, just prior to the time that Respondent was expanding its operations. The internal departmental report, prepared in advance of the noncompliance letter to Respondent, described wholesale deficiencies in the TNS radiologic safety program: ''Initial training of employees seems primarily concerned with operational procedures and very little with . . . radiation safety;'' smear tests and air monitoring ''grab'' samples showed consistently high concentrations yet no one was taking steps to lessen this problem; pocket dosimeter records were inadequate; TLD whole body badges were open, lost or contaminated; also . . . personnel were receiving consistently high exposures; with numerous documented incidents of overexposures, TNS does not seem to have provisions for assuring that these people do not continue to receive high exposures.'' (G.C. Exh. 60a.) Summing up, the TDRH report stated: ''The present quality of their overall radiation safety program is not adequate to encompass the scope of their present and future production level.'' Id. After summarizing the areas of noncompliance in a letter dated December 5, 1979, the Department's final words to TNS were ''a severe laxity in your facility's radiation safety program has developed. Immediate attention should be given to upgrading this program.'' (G.C. Exh. 60b at 3.)

Respondent's December 17, 1979 answer to the TDRH noncompliance letter typified the manner in which it would deal with the State's criticisms thereafter: TNS either denied that problems existed or made vague promises to take unspecified corrective action in the future. For example, responding to the TDRH criticism that the radiation safety program was not well administered, then TNS President Soppet asserted that ''the radiation safety program . . . is considered to be one of the more important parts of the license; the air monitoring program was being reassessed, individual on-the-

[128] ICRP Publication 26, Recommendations of the International Commission on Radiological Protection at 90 (1977).

[129] Dr. Eagilman testified that this conclusion was based on his search of the international scientific literature.

job training was ongoing.'' (G.C. Exh. 60c at 1.) Addressing the TDRH comment that personnel who were overexposed had failed to receive written reports of their overexposures, TNS made the first of what would be many identical promises; that is, in the future, it would perform its obligation to provide such reports. This promise never was kept prior to the strike. Respondent's failure properly to inform individuals about their bioassay results is more serious than it might seem at first blush. If exposures are not revealed either to the concerned regulatory agency or the affected worker, both are deprived of the knowledge needed to take preventive measures. Respondent's numerous lapses and equally numerous promises to comply with the State's right-to-know provisions also suggest that the Respondent did not take seriously its duty to comply with the state regulation. In this context, Barlow's ''off-the-record'' uncontroverted admission to a TDRH inspector that the consistently high exposures partially were due to management's business decision ''to leave a person at the same position that he/she already work efficiently at, no matter what kind of exposure that he/she may be exposed to consistently'' is particularly revealing. (G.C. Exh. 60f at 2.)

2. April 10, 1980 visit

In response to a Congressional inquiry about an employee's suspected overexposure of 17,000 ug/l, TDRH agents paid a special visit to TNS on April 10, 1980. Although the investigation was inconclusive regarding the employee's overexposure, the internal departmental memorandum contained this comment: ''There appeared to be conditions that such an exposure of this type could have occurred.'' (G.C. Exh. 60jj at 3.) A letter dated September 17, 1980 pertaining to this inspection cited TNS for the following violations: training of employees was inadequate; collection methods for bioassay samples provided opportunities for obtaining unreliable results and the entire system for airborne contamination control had to be reviewed. (G.C. Exh. 60kk.)

Barlow answered for the Respondent, defensively stating that TDRH had not interviewed an adequate cross-section of the work force. With respect to the urinalysis overexposure which had triggered the inspection, Barlow stated that the Company did not believe the urine samples were purposely contaminated, a charge that Respondent later made when tensions with the Union heightened prior to the work stoppage.

3. Noncompliance letter of August 1980

Following inspection in May 1980, TDRH's next letter to TNS dated August 25, 1980, cited 16 areas of noncompliance, 6 of which repeated violations found the previous year. Sounding a note of alarm, TDRH stated that based on air monitoring, instrument and smear survey records, there was an imperative need to reduce ''radioactive contamination levels for . . . personnel . . . are consistently receiving high exposures and overexposures'' in excess of applicable limits.'' (G.C. Exh. 60l at 1.) The Department again criticized TNS for inadequately training its personnel and suggested that this failure contributed to the employees' ''consistently high exposures.'' (Id.)

The TNS reply again denied that employees were inadequately trained and protested that any indication of employee discontent with training was limited to a few disgruntled individuals. In addition, while conceding that a few individuals had been exposed to radiation in slightly elevated amounts during certain calendar quarters, their accumulated annual dose had not exceeded regulatory limits so that the Company felt it was ''well within our legal rights.'' (G.C. Exh. at 2–3.)

4. November 1980 inspection

The TDRH inspection in November 1980 had the limited objective of determining whether Respondent had cured previously cited problems. A memo prepared by an NRC official who accompanied the State inspectors on this trip, noted that following a management reorganization, the TNS Radiation Safety officer was given a lower rank in the bureaucratic structure; that there was no health staff coverage on the night shifts when some of the higher air samples occurred; that contamination levels persisted in unrestricted areas; engineering controls and better training for employees were needed; that a fixed continuous air sampler in the small derby area was too distant from the operator; that radiation warning symbols were not posted at entrances to all controlled areas;[130] that the ALARA concept needed to be strengthened; and that notices to workers containing information regarding the TNS operating license, regulations, administrative and cleanup procedures, needed to be posted.

The state inspector noted that during this plant tour, several operators were seen handling radioactive materials without wearing wrist badges, finger ring detectors or gloves. An employee who was asked whether he had learned how to reduce his personal exposure, answered affirmatively, all the while resting his hand on a derby. In the penetrator shop, the inspector observed a maintenance worker reading while perched on a stack of penetrators. The TDRH representative also interviewed the Local Union president, Johnny Bettis, who told him that the Company had failed to take action on a list of reported hazards including ''excessive smoke from the chamfer; excessive dust in the large derby breakout area and greensalt spills in the large derby blending area.''[131] Noting that a rack of unshielded derbies was stored near the vacuum furnace area, TDRH commented that simple engineering controls to reduce beta-gamma exposure were noticeably absent.

TDRH noted that workers consistently received high whole body exposures in the vacuum furnace area, and that Hoynacki was aware of this situation, suggesting that it was caused by the release of DU daughter products during the vacuum melt process. When the inspector asked to review the personnel exposure histories for workers who received doses in excess of the regulatory standard for the second and third quarters of 1980, Barlow admitted that he did not have them.

Due to time constraints, the TDRH agents did not thoroughly examine air monitoring records during the November 1980 inspection. However, their abbreviated review did reveal air concentrations exceeding MPC in the restroom,

[130] TDRH regulations required that a radiation symbol (three, purple-colored blades in a yellow circle) be posted at the entrance to every high radiation area within the plant.

[131] Bettis was supposed to send TDRH a list of hazards identified by the joint union-management health and safety committee. He failed to do so.

changeroom and vacuum furnace area. These findings led them to conclude that ''further investigation is warranted to determine if limits are being exceeded on a quarterly basis.'' (G.C. Exh. 60o at 3.)

By letter of January 29, 1981, TDRH cited TNS for noncompliance in 15 areas. Although many of the violations listed in this communication were identical to those found 1 and 2 years previously, TDRH stated with customary tact and patience that ''Several of the items of noncompliance indicated above have been called to your attention in letters reflecting the results of previous inspections. It appears that sufficient effort is not being asserted to prevent the recurrence of these items . . . .'' (G.C. Exh. 60 at 3.)

The TNS February 25, 1981 response to the TDRH noncompliance letter is noteworthy for its omissions. Respondent had found it necessary to initiate a mandatory respiratory program several weeks previously in response to elevated urine sample results and air concentrations exceeding MPC, yet no reference to either the problem or the program appears in the Company reply, although these were circumstances that should have been reported. Instead, narrowly responding only to items specifically raised in the TDRH letter, the Respondent said, in effect, that it would comply with what was minimally required by law. Then Vice President of Operations G. L. Christensen wrote that the TNS license did not require the Company to perform beta-gamma surveys but it would do so when deemed appropriate. As for the one worker who exceeded whole body exposure limits in a calendar quarter, Christensen wrote that it knew of no operation which could have caused such an exposure and rationalized that annually he had not exceeded the 5 rem ceiling. He also disputed TDRH's finding that air samplers were incorrectly positioned, insisting that they were stationed so as to permit a sampling of general areas and that portable breathing zone samplers, worn by employees for an entire work shift, would better serve to measure concentrations at individual work stations. Respondent had to know that to sample a general area tells nothing at all about the air concentrations inhaled by a specific individual and that its answer was an evasion of a potentially serious problem. Further, since Respondent possessed only 2 BZ samplers and had employees wearing them only for the length of a shift, it did not identify contamination levels in any given area for an entire work week, and certainly not for an entire quarter.[132] TDRH apparently was unsatisfied with the TNS reponse for it sent a followup letter seeking additional information about the Company's methods for handling and counting air, water and smear samples.

5. The March 9 and 10, 1981 visit

TDRH paid an informal call on Respondent on March 9 and 10, 1981, prompted in part by receipt of an anonymous complaint from an employee who accused TNS of dumping radioactive materials on the ground and washing it off into a drain which flowed onto a public area beyond the plant's confines.[133]

On this occasion, the TDRH inspectors focused chiefly on the environmental matter raised by the complaint.[134] They did not review previous TNS inspection reports and companion letters of noncompliance to TNS. Neither did they review the Company's exposure records or air contamination surveys, nor take independent samples of their own, and they did not examine other operations in the facility. However, they did observe almost all of the workers in the derby, mold prep and incinerator areas of the plant wearing respirators. In a memo summarizing the visit, the TDRH inspector mentioned that he discussed the overuse of respirators with Hoynacki. However, there was no reference to the length of time that respirators had been worn. At the hearing, Inspector West testified that he must have been unaware that a mandatory respirator program was in effect for he did not recall seeing any penetrator shop operator wearing a mask.

Given the limited scope of this review, there is no foundation for Inspector West's sweeping conclusion that ''there are many areas that need improvement and constant updating but it appears that at the present time no crisis or eminent (sic) threat to health and safety exists. The biggest problem . . . is that they have not studied the various perimeters and situation enough to know if there is a problem.'' (G.C. Exh. 60v at 3.)

Regrettably, TDRH did not heed its own advice and study the various ''perimeters and situation'' enough to know if there were problems at this time. If this visit had been more thorough, perhaps TDRH would have discovered that many employees in various sections of the plant were enduring respirators for prolonged periods. Instead, it was not until many months later that West indignantly demanded to know why TNS had not previously divulged to TDRH that it had imposed a mandatory respirator program.

6. The union telegram and May 5–6 investigation

On April 29, OCAW telegramed TDRH to register its fear of imminent danger due to high urine counts and the excessive use of respirators at TNS. TDRH Inspector Brooks arrived at TNS on May 5 to investigate the Union's charges. He found a picket line outside the plant and Hoynacki on guard within.

Inspector Brooks' report makes clear that the scope of the TDRH May 5–6 review was hampered by the Respondent's refusal to cooperate. Hoynacki claimed that he had no obligation to disclose information which was allegedly proprietary. Consequently, the Inspector did not review data pertaining to all work stations in the plant and relied on weekly data supplied to him by Hoynacki. Apparently vexed, he wrote ''I was finally able to determine that there were individuals in the penetrator shop who were being required by management to wear respirators for the duration of 8 hour working shifts.''[135]

Although Brooks was advised that the decision to introduce a compulsory respirator program was based on a memo of January 23, 1981, it is not clear from the record that he

[132] In the years following the work stoppage, Respondent acquired 20 BZ samplers.

[133] The author of the letter wrote that he (or she) did not wish to reveal his identity for fear of being fired.

[134] The inspection disclosed that contamination, in fact, was escaping from the restricted area surrounding the plant through a liquid drain, just as the complaint alleged.

[135] Brooks did not determine whether Respondent was complying with Reg. Guide 8.15 or NUREG 0041 and made no reference to such matters in his report.

also understood that the actual, shift-long use of the respirators actually began on that date.[136]

The TDRH office report also described Respondent's policy with respect to exposure standards; that is, an employee was relocated if 1 urine sample registered over 1000 ug/l or if 2 consecutive counts were over 100 ug/l. Noting that since January 1, 1981, 8 employees who exceeded these ceilings were transferred to other positions, the Inspector commented that relocation only meant that an employee was shifted to another production area where the probability of exposure was presumably but not demonstrably lower. Brooks then listed examples of 5 employees who had received consistently excessive urinalysis results, each of whom had at least 6 reported test returns over the Company's 50 ug/l notice level, and 2 of whom had received doses over the 100 ug/l action level. Brooks also learned that even although the Respondent had improved its urine collection techniques to avoid contamination, 2 employees nevertheless had received counts above 1000 ug/l. With necessary data withheld, the obviously frustrated TDRH inspector concluded that

> Since the Department is denied review of such data it is impossible to determine whether actions taken with respect to some health and safety items are appropriate . . . .
>
> In view of staffing and time restrictions, the withholding of health and safety data impairs the ability of the inspector to meet his mandate. . . . and thereby fulfill the Department's obligations to the occupationally exposed persons of TNS, Inc. (G.C. Exh. 60cc at 4.)

The TDRH answer to OCAW's telegraphed complaint, dated June 4, 1981, failed to squarely respond to the Union's concerns or allude to the difficulty in obtaining the requisite information.[137] In addressing the Union's allegation regarding high urine counts, TDRH simply wrote that ''some employees have been relocated because urine sample results exceeded 'action levels' which appear to be in line with those at other similar facilities at levels below which hazards to employees have been shown to exist.'' (G.C. Exh. 60ee.) Without making an independent judgment, TDRH accepted Respondent's position on the matter of standards. West failed to consider the stricter ceilings proposed in Reg. Guide 8.22, for as he admitted at the hearing, he had no knowledge of the chemically toxic properties of DU and mistakenly believed that Reg. Guide 8.22 did not apply to a plant such as TNS which processed greensalt.[138]

TDRH's reply to OCAW's second concern regarding the excessive use of respirators was equally noncommittal and misleading. Without mentioning that the Respondent had withheld data bearing on air quality surveys in the very areas of the plant where respirators were most required, West wrote, ''the company has not performed any study that would indicate a requirement for workers to wear respirators for a full 8-hour . . . shift.'' (G.C. Exh. 60ee.)[139] Yet, 3 months earlier, in a March 3 letter to TNS, the same inspector had condemned Respondent's routine use of respirators, insisting that they be reserved for emergency situations or short-term jobs and asking TNS to justify the full-time use of masks. TDRH was still awaiting a study justifying the use of respirators in January 1982.

The letter which Inspector Brooks sent to the Respondent on June 4, was less abrasive than his internal inspection report. Although deprived of relevant information and with production at TNS halted, Brooks' letter still identified certain problems:[140] process or engineering controls were not sufficient to limit concentrations of radioactive materials; individual intake of radioactive materials within a 7-day period exceeded regulatory standards; employees' intake over the calendar quarter exceeded applicable limits and lastly, TNS had failed to notify the Department of excessive exposures. This letter contains no reference to the length of time that employees were required to wear respirators for an entire shift. Moreover, Inspector Brooks felt that without air monitoring data, he was unable to refute Hoynacki's assertion that foundry employees did not wear respirators for protracted periods of time.

Several weeks later, in a letter dated June 17, 1981, TNS Vice President of Operations Christensen admitted to TDRH that the process/engineering controls were insufficient to limit air contamination; that TNS was aware of these conditions and since January 22, had mandated the use of respirators as an interim measure while substantial sums were expended to resolve the problem by introducing new equipment. Significantly, Christensen also admitted that TNS had failed to disclose to TDRH that its air monitoring data had recorded concentrations exceeding MPC for the previous calendar quarter.

Evidently concerned by the TNS response, TDRH quickly demanded to know when processing controls would be installed. The Department also asked for data to support the Company's contention that employees were not exposed to radioactive materials above regulatory levels with ''sufficient details to substantiate the effectiveness of the respirator program.'' (G.C. Exh. 60gg at 1.) TDRH again took issue with Respondent's contention that its 3-1/2 month long mandatory respirator program was temporary, cautioning that ''the establishment of a respirator program is not recognized as a permanent solution for minimizing exposure . . . .'' (Id.)

By letter of September 4, 1981, the Respondent advised TDRH that the GAU 8 penetrator program had been terminated, thereby eliminating the need for engineering or proc-

[136] Inspector Brooks made no reference to, and apparently was unaware of, a March memo drafted by West which mentioned the shift-long overuse of respirators in the foundry.

[137] Inspector West prepared the response to the Union although he had not participated in the inspection with Brooks.

[138] West apparently was unaware that an earlier TDRH report had referred to a DOE facility in Padukah, Kentucky, which used an action level of .67 ug/l. See G.C. Exh. 60jj at 2; but see R. Exh. 433 which indicates that a plant in Massachusetts which manufactured derbies using DU, had an action level of 120 ug/l. Neither document mentions the extent to which employees at the respective facilities approached or exceeded these uranium-in-urine limits.

[139] Inspector West testified at the hearing that it made no difference that TDRH was unable to obtain information regarding the 11 work areas in the plant which had elevated airborne levels of contamination because data from other sectors of the facility did not exceed regulatory limits. His answer is a non sequitar for even if air quality was exemplary at some locations, this does not mitigate the harm that may occur when airborne contamination is excessive elsewhere.

[140] TDRH sent TNS a copy of its vacuous response to OCAW but did not accord the same courtesy to the Union by sending it a copy of its June 4 noncompliance letter to Respondent.

essing controls in the penetrator shop.[141] However, the Company made no mention of steps it would take to reduce excessive contamination in the foundry. Addressing the Department's inquiry about the effectiveness of the respirator program, Hoynacki admitted that the results of the urinalysis samples did not initially demonstrate that the program was successful, but claimed a major improvement in urine bioassay results after March 30 when the specimen collection date was changed. However, as mentioned above, urinalysis data collected before March 30 cannot be compared reliably with bioassay results after that date when the Company implemented rigorous collection procedures and included in its sampling, persons who were transferred from the penetrator shop. Consequently, Respondent failed to supply TDRH or this tribunal with reliable evidence that the protracted use of respirators had a beneficial impact on reducing uranium in the employees' urine.

7. October and December 1981 inspections

AN NRC agent accompanied TDRH during its next inspection of TNS in October 1981. Since most of Respondent's operations still were shut down, the NRC official focused on the large derby breakout area. In a memo attached to the State's report, he noted greensalt released at the weighing and blending station; greensalt escaping around the closure between the retort and breakout pad; sparks created when the derby was wire brushed; visible dust released when emptied greensalt drums were inverted on the breakout pads, and greensalt spilled in the traffic isles. He also observed a worker cleaning up the greensalt by hand without donning a respirator and other employees performing tasks without protective gloves as the situation required. These observations suggest that Respondent still had not implemented controls to properly contain uranium dust in the foundry and continued to tolerate unhealthy practices by its employees after the strike much as it had done before.

The primary purpose of the TDRH October review was to collect data about compliance matters which had been withheld by the Respondent during the previous May inspection and not so much to inspect Respondent's current, curtailed operations. On examining Respondent's monitoring records for this earlier period, the TDRH inspectors determined that 5 areas of the foundry had contaminated air concentrations above MPC throughout the last and first quarters of 1980 and 1981, respectively. TDRH also commented that TNS presented no evidence to show that the Company ''had a health physics program to correct these problems, leaving the Department with ''specific concerns regarding appropriate supervision of respirator use, process containment of dust, surface contamination control, monitoring techniques, etc.'' (G.C. Exh. 60rr at 1.)

Additionally, TDRH concluded that Respondent's monitoring program was seriously deficient. Consequently, the Department had no confidence that the employees were protected from excessive levels of radiation or that individual exposure records were accurate. TDRH based its reservations in part on (a) the absence of records which show that TNS took any action when instrument and smear surveys measured radioactive contamination in excess of its action levels; (b) air samples which inappropriately covered periods of time greater than one shift; (c) Respondent's failure to reposition incorrectly placed air monitoring devices; (d) excessive increase in many employees' uranium lung burdens over a short period of time;[142] (e) TNS was not using smear and instrument surveys to check for beta activity which was excessive according to TDRH's independent measurements; and (f) the Respondent was not calculating beta activity in waste water discharged to the plant's holding pond. Here, too, the TDRH sample contained beta activity in excess of the MPC for thorium 234.

After reviewing additional data collected during the prestrike period, TDRH ended its letter to the Respondent with the following rebuke: ''Your safety program was inadequate to protect workers from unnecessary radiation.'' Rather than dwelling on the past, TDRH urged Respondent to commit itself ''toward revamping its program . . . to insure that employees will no longer be necessarily exposed to radiation. . . . An important phase of this effort must be a consideration of total containment for all processes so that uranium dust exposures can be brought under control. . . . TNS (must) immediately secure the expertise in resources necessary to implement an adequate safety program.'' (G.C. Exh. 60rr at 3.)

Beneath the civil veneer of this letter, the Department's message was unmistakable: uranium dust in the plant was excessive; employees were unprotected from radiation; their exposures were out of control; TNS did not have an adequate safety program and had to rectify these problems forthwith. For an administrative agency whose prior correspondence with Respondent showed extraordinary restraint, the January 28, 1982, letter was surprisingly severe. Six months earlier, Respondent had sent a telegram to the striking employees assuring them that state authorities had given TNS a clean bill of health. Respondent's assurance was premature and inaccurate in light of the State's later findings.

By February 17, 1982, when TDRH next inspected TNS, some improvements had taken place, others soon were to occur. For example, TDRH inspectors learned that the health physics staff would be expanded with 2 persons to be assigned to each shift.[143] They determined that no location within the facility had air contamination levels over MPC for the final quarter of 1981 or in January 1982, although a sizeable number of single samples reflected concentrations over 50 percent of MPC. Average urine test results at the beginning of 1981 were 30 ug/l; at the end of the year, the average had dropped to 8 ug/l.[144] TDRH reported that according to RSO O'Brien, TNS had adopted new action levels with

[141] At meetings with the Union in 1982, TNS agreed to bargain about reopening the penetrator line. (See Part Two, sec. VII,A, infra.)

[142] TDRH, like NIOSH, believed that the employees' in-vivo lung scans were evaluated according to a standard which undervalued the results.

[143] When monitoring disclosed elevated air concentrations, the RSO was authorized to notify the supervisor and request an inquiry. However, the TDRH memo noted that many of the supervisors' responses were merely justifications of what had occurred with little emphasis on what had been done to protect the employee.

[144] Because Respondent's operations were curtailed during this period of time, the employees' low exposures were not necessarily due to reforms in the health and safety program.

90 percent MPC set as the peak for air concentrations and 30 ug/l as a maximum action level for urine test results.[145]

Notwithstanding these improvements, TDRH still found that process or engineering controls were not being used in many areas of the plant to reduce radioactivity to 25 percent of MPC and that workers continued to be exposed to unnecessary radiation. At this point, however, TDRH was addressing the extent to which Respondent was complying with the ALARA concept, and not with whether TNS was exceeding specific regulatory ceilings.

In the late spring of 1982, Respondent submitted and TDRH began to approve numerous amendments to the TNS operating license. In these amendments, Respondent pledged to shut down operations immediately when MPC exceeded 25 percent for a week or 50 percent for a single workday. Pursuant to one such amendment, when elevated air concentrations were recorded at the B & O cutoff machine on or about January 27, 1982, Respondent shut down and did not resume operations until ventilatory controls were installed. Cole testified that notwithstanding these exacting license amendments, Respondent reached an understanding with TDRH which permitted TNS to exceed MPC by 100 percent in certain circumstances. Michael Mobley, then newly appointed director of TDRH, was called as a rebuttal witness and flatly contradicted Cole's assertion.

VI. EVENTS LEADING TO WORK STOPPAGE

A. *Introduction*

The General Counsel and Charging Party maintain that a series of pivotal events unfolded in the several years prior to the work stoppage which gradually alerted the employees to abnormal dangers in their workplace. Cumulatively, these events galvanized the workers into taking strike action after they failed to obtain redress from the Respondent for perceived dangers in their workplace. Counsel submit that the earliest event which contributed to molding the employees' consciousness was a training program held in late 1979 at Respondent's facility in Compton, California. As a result of this training experience, the TNS employees contrasted their own working conditions at TNS unfavorably with those in California. In 1980, the Local's president began to attend educational seminars conducted by the OCAW's Atomic Energy Council and shared his experiences with his fellow members. The Local also initiated health and safety tours in conformance with the collective-bargaining agreement. The Respondent's failure to correct conditions noted during these tours, together with management's posture during collective-bargaining negotiations, further convinced the employees that strike action was necessary to cure unhealthy working conditions in the plant.

The Respondent asserts that the workers' professed concerns about health and safety were purposely exaggerated and insinuated into collective-bargaining negotiations at the eleventh hour to mask the fact that economic concerns and personality conflicts actually divided the parties. Consequently, Respondent contends that the employees did not hold a good-faith belief that they were working under abnormally dangerous conditions when they engaged in the work stoppage.

B. *The Compton Experience*

Prior to opening the penetrator shop, Respondent sent approximately 12 senior TNS operators to a training program at its plant in Compton, California, where the GAU-8 core was in production.[146] After returning to Tennessee and working in the TNS penetrator shop, these employees began drawing invidious comparisons between their own working conditions and the cleaner environment they had experienced at the California facility.[147]

The employees described the Compton plant as larger and less crowded than the TNS penetrator shop. They observed that the machinery at Compton was newer than the equipment at TNS. Further, the machines at Compton were surrounded by plexiglass which prevented the spray mist from escaping, as they found it did at their own plant. Each piece of equipment at Compton was separately connected to its own torit mist collector, whereas at TNS, one mist collector served two grinders. Perhaps because of the shielding and more generous ventilation at Compton, the TNS employees did not see black dust in the atmosphere or water spillage on the floors there. When filters in the Compton torit mist collectors had to be changed, the machinery which it serviced was turned off. Not so at TNS. The TNS employees noted that their California counterparts did not wear respirators. They also noted that penetrators were stored in a separate building at Compton, whereas at TNS they were stored on open racks.

The TNS trainees recalled that at Compton a special three-man crew worked exclusively on janitorial tasks, while at TNS, two men performed similar services on a sporadic basis and often were diverted to other jobs. The TNS trainees also seemed impressed by the six-person health and safety team at Compton. They noted that under the direction of the Compton RSO, health and safety staff were on the shop floor constantly, testing the air flow on the mist collectors, measuring the depth of the sludge in the holding tanks below the machines, or checking other aspects of the equipment. The employees had not seen similar vigilance by the TNS health and safety staff.

The employees also described the change room at Compton as far cleaner than the one at TNS. Showers were not mandatory at Compton, apparently because employees did not emerge at the end of their working day with uniforms soaked by spray or flecked with grinding specks. Further, the Compton change room was divided into 3 zones: the employees left their contaminated work shoes in the middle zone, which served as a buffer between the dirty and contaminated sides. On leaving the Compton change room, a hand-held geigercounter was available so that employees could monitor themselves for contamination. Respondent did

[145] See G.C. Exh. 76oo which also refers to Respondent's intention to adopt a 30 ug/l action level. At the hearing, Respondent's current RSO, Leslie Cole denied that TNS ever adopted the 30 ug/l standard proposed in Reg. Guide 8.22. Respondent did not present O'Brien as a witness to refute the statement TDRH attributed to him.

[146] Some of the TNS trainees were among the most active Union members.

[147] The employees offered consistent, uncontroverted descriptions of working conditions at Compton.

not obtain a similar device for the TNS change room until a month before the strike and did not install it at time.[148]

The trainees also noticed that at Compton, urine samples were taken on a weekly rather than bimonthly basis. Moreover, workers were required to surrender cigarettes before entering the plant. No similar discipline was imposed at TNS.[149] Respondent suggested that the absence of a foundry at Compton accounted for the greater cleanliness there. However, the foundry at TNS was in a self-contained building separate from the penetrator shop. No evidence was introduced which would indicate that contamination from the foundry drifted into the separate penetrator shop at TNS.

Respondent did not dispute the employees' testimony regarding conditions at Compton, but suggested that the trainees' real concern was with the higher wages paid to their California counterparts. The TNS employees certainly were mindful of the wage disparity, but their testimony and demeanor plainly revealed that the working conditions at Compton were more important to them than the financial discrepancy.[150]

Subsequently, Respondent created a new job classification for penetrator shop operators and granted a pay raise to employees in that classification. Some of the Union members suspected Respondent of attempting to foment disunity by granting raises to only a portion of the work force. Consequently, an across-the-board pay hike became one of the issues raised by the Local when collective-bargaining negotiations began in March 1981.

C. *The Union's Role*

In 1978 when OCAW organized the 28 employees then composing the TNS work force, the unit was so small that it was included in an amalgamated Local in Johnson City. The parties negotiated their first 3-year contract effective on May 1, 1978, which contained, inter alia, a brief health and safety clause and a provision for monthly health and safety tours by a joint union-management committee.

As TNS expanded under Aerojet's management, the work force grew to 96 employees by late 1980, almost all of whom were union members.[151] In that year, a separate OCAW Local was formed to accomodate the enlarged TNS unit and John Bettis, who was to play a major leadership role prior to and after the work stoppage, was elected president. Soon after Bettis took office, the Local joined the Atomic Workers Energy Council, a group which served the interests of Union members working in the nuclear industry. Bettis, the Local's delegate to the Council meetings, attended a session in the fall of 1980 at which Dr. Mark Nelson lectured, presented a slide show, and distributed literature dealing with the damaging health effects of radiation in the workplace. Bettis returned to TNS and began to campaign against what he believed were unhealthy conditions at the plant, using Union meetings as his principle forum. Several employees testified with some bemusement that Bettis often engaged in harangues about health and safety matters.

Bettis also insisted that the Respondent comply with the neglected clause in the collective-bargaining agreement providing for joint union-management health and safety tours. A committee including Bettis, one other union member and two management representatives began monthly plant inspections. At the conclusion of each tour, Brad Squibb, one of the management participants, prepared a written report detailing the conditions noted by the union members and the corrective action to be taken. Copies of the reports were posted conspicuously on a bulletin board above the employees' timeclock and were widely circulated to various supervisors and other management personnel. They also were a continuing subject of discussion at union meetings. From the first report in July 1980 to the last in April 1981, these memos recorded the employees' complaints about health and safety hazards in the plant.

The most persistent complaint in every inspection report concerned dust and dirt in the vacuum furnace and breakout areas of the foundry; malfunctioning, ineffective dust collectors; oil, water and sludge around the grinders and spray lube in the penetrator shop; mist and oil spraying from the chamfer and the lack of ventilation over the lathe and hacksaw. Other recurring criticisms related to the cracked and corroded cement floor in various areas of the facility,[152] and unsanitary, unhealthy conditions in the change rooms.

These reports are instructive for several reasons: first, they contain many of the same complaints mentioned by employee witnesses in this proceeding, thereby confirming the fact that their safety concerns were not of recent invention; second, the reports establish that Respondent knew of the faulty conditions and of the employees' complaints long before the strike occurred. The Company's failure to correct many of the conditions listed in the reports provided potent evidence to the employees of the low priority management attached to their health and safety concerns.

Apparently outraged with management's failure to correct the long- standing health and safety problems noted in the inspection reports, Bettis sent the following message to management on March 10, 1981:

> the employees will not return to work after April 30 until the items which are on the health and safety report have been corrected and TNS is safe and healthy for the employees to work. This includes the items from past inspections as well as items which will be listed during the April inspection.

In addition, Bettis expressed ''extreme concern over the layout and conditions in the men's room as being unhealthy.'' (G.C. Exh.) One month later, with few corrections made to items on the joint committee reports, Bettis compiled and

[148] The record does not reveal whether Respondent also purchased a similar device for the women's change room at that TNS.

[149] TNS employees were permitted to retain their cigarettes but had to confine their smoking to uncontrolled areas of the facility.

[150] The employees recalled their Compton experience vividly, testifying in a somewhat wistful manner about it. They also acknowledged realistically that a more costly standard of living in California accounted in some measure for the higher wages there, leading me to conclude that the pay disparity was not the crucial or sole factor which impressed them.

[151] Approximately 96 percent of the work force joined the Union, a large number, given the fact that Tennessee has right-to-work legislation.

[152] The absence of a smooth floor posed a special radiation problem, for crevices in the broken surface provided optimum conditions for trapping contaminated dirt, dust, and greensalt. See *Introduction to Radiation Protection* at 122–123 (smooth, noncorrosive surfaces necessary in facilities using radioactive materials).

submitted to management a comprehensive tally of 93 health and safety problems, many of which had been noted on earlier lists. Some time after the strike began, and after the RMC report had confirmed many of the conditions noted on the Union's final list, Hoynacki and Squibb prepared an internal rebuttal which, for the most part, either denied that a problem existed or blamed the condition on the employees.

D. *Early Strike Discussions: The ''Immediacy'' Issue*

During the course of the hearing, Robert Shaw, Esq., moved to intervene on behalf of a number of individually named employees, alleging, inter alia, that the General Counsel had not elicited testimony regarding the employees' early interest in striking over unhealthy conditions in the plant. The parties opposed the motion, but limited intervention was granted to pursue this matter, which was referred to during the hearing as the ''immediacy issue,'' an allusion to dictum in *Gateway Coal Co. v. Mine Workers*, supra at 385: ''Section 502 authorizes a work stoppage called solely to protect employees from immediate danger.'' (emphasis added.)[153] The Intervenors' and Union's divergent factual contentions on this issue follow.

Several employees testified that months before the strike occurred, they raised the possibility of striking over unhealthy conditions in the plant with Union busines agent Abel. For example, Mike Elam, related that he told Abel in October or November 1980 that employees were complaining about working conditions and starting to talk about striking. Abel allegedly responded that the employees might lose their jobs if they engaged in a wildcat strike.

Elam again mentioned taking immediate strike action over health and safety conditions in the plant at a union meeting in either November or December 1980.[154] According to both local Union President Bettis and Elam, Abel told the members that they would jeopardize their jobs if they struck before the contract expired.

Brad Richardson also testified that he spoke with Abel about a safety strike sometime in 1980. Abel purportedly replied that the employees would have to live with their 3-year contract.

Finally in March 1981, after the respirator policy had been in effect for several months and a few employees who were unable to wear their respirators had been suspended, a number of penetrator shop operators walked off the job. Bettis persuaded the workers to return. He testified that when he reported this event to Abel later that same day, Abel urged him to hold the men in line or the Company would fire them; that they would take care of the problem in May. In his affidavit appended to the Charging Party's Opposition to the Intervention motion, Abel denied making the foregoing statements.

It is difficult to determine where the truth lies in this dispute. On the one hand, Abel occasionally revealed a flagging memory. On the other hand, several of the Intervenors harbored great hostility toward representatives of the International Union and may have been biased in this respect. At a minimum, I am certain that Bettis reported the walkout to Abel. It is likely that Abel counseled Bettis to maintain calm, since collective-bargaining negotiations were under way. However, I find it unnecessary to resolve these conflicts since even if some of the employees considered striking over health conditions and were persuaded not to do so prior to the expiration of the collective-bargaining agreement, I am convinced, contrary to Respondent's contention, that such action would not undermine the claim that the employees ultimately struck in good faith over abnormally dangerous conditions. Analysis of the so-called ''immediacy'' issue follows in Part Three, I,B, 2 of this Decision.

E. *1981 Prestrike Negotiations*

1. Early informal meetings

Before the negotiations officially commenced, Respondent arranged informal meetings with Business Agent Abel and OCAW's district director, John Williams.[155]

Abel attended the first meeting alone, with Williams joining him the following evening. Kriska testified that on both dates, the union agents attacked the ''slave'' wages paid to the TNS employees and the poor relationship which had alienated the employees from certain management officials. Kriska recalled that Williams expressed great animosity toward Ronald Sparks, TNS industrial relations manager, but was certain that health and safety issues were not mentioned.

In December 1980, Abel began preparing for the forthcoming negotiations by eliciting contract proposals from the employees. On February 17, 1981, he and Williams again met informally with Kriska and Elwood Moger, counsel for Aerojet Ordnance. At one point, when Kriska defended Sparks' reputation, Williams became extremely angry and vowed that if Sparks and Respondent's attorney, William Earnest, attended the negotiations, a strike surely would ensue. Kriska testified that the union representatives did not allude to health and safety concerns on this occasion either, and, therefore, he had no inkling that such matters would be raised subsequently.

Williams conceded that he objected to Sparks and Earnest participating in negotiations, but meant only that in his view they were incapable of acting in good faith and, therefore, would stymie agreement. Both Abel and Williams testified that at this meeting, they criticized the extended use of respirators and high urine test results.

Since neither Abel nor Williams had clear recollections of their discourse at the November meetings, I am inclined to credit Kriska's testimony that health and safety concerns were not discussed at that early stage. However, by the time of the February 17 meeting the respirator policy had been in effect for almost a month, and several employees who were union activists, including the voluable Mickey Lenoir, had been transferred from their regular work areas because of excessive uranium-in-urine results. In these circumstances, I

[153] Respondent argues that the employees' early expressions of an interest in striking defeats the requirement of Section 502 that a work stoppage must be in reaction to an immediate danger.

[154] Minutes for the Local's November 1980 meeting contains 18 items, one of which states cryptically ''April 30 strike!'' (R. Exh. 23 at 1.)

[155] Williams began his Union career as president of a local at a nuclear facility near TNS where he also chaired the employees' safety committee. He became an international representative in 1975 and in 1978 negotiated the first union contract for TNS, servicing it until he became district director in 1979. Williams, a member of OCAW's Atomic Energy Council for 25 years, encouraged the TNS Local to join the Council.

find it highly unlikely that Abel would not have known about and failed to raise such matters with Respondent's chief negotiators. Even assuming that neither Abel nor Williams (a man who had demonstrated a long-term interest in health and safety matters), did not refer to any health problems during the February meeting, Respondent certainly had notice of these matters from other sources. Lenoir testified without controversion that while attending a grievance meeting with Sparks and Hoynacki in early February, he and John Bettis were introduced to Moger and Kriska who asked them about problems in the plant. Lenoir related that he pointed to Sparks and Hoynacki as two of the problems, but also mentioned health and safety concerns, including the mandatory respirator policy, the inadequate ventilation system and management's failure to answer employees' questions about health matters. A month later, Bettis delivered his March ultimatum which surely alerted Respondent's officials to the employees' insistence that the plant had to be made clean and safe in order to avert a strike. In light of these unambiguous expressions, a claim by Respondent's officials that they were unaware of the employees' health and safety concerns reflects a lapse of memory or is simply disingenuous.

2. Formal negotiations

The first of the nine negotiating sessions held prior to the work stoppage began on March 24, 1981.[156] At the outset of the meeting, Abel raised two problems concerning the reassignment of a pregnant worker to the TNS laundry facility and the suspension of two other employees who were advised that they had high urine counts.[157]

Seizing the initiative, Kriska distributed copies of the Respondent's comprehensive contract proposal. He pointed out that it contained a $1 across-the-board hourly wage increase which, if accepted, would take effect on April 1. Abel reacted vehemently to what he regarded as management's effort to divert the employees from other concerns with an enticing economic offer. The Union asserted that as the party which had moved to reopen the contract, it was entitled to present its proposal first. Abel then reviewed the Union's proposal which contained a number of fairly typical contract terms dealing with such standard matters as seniority, the grievance-arbitration procedure, holidays and vacations. A new clause dealt with cancer insurance. In addition, the Union proposed to substitute for the health and safety clause in the current agreement, a lengthier, two-page article which retained joint union-management health and safety tours, inspection of the plant by union representatives or their agents, health surveys by qualified consultants paid for by TNS, and a commitment by the Respondent to maintain adequate health and safety facilities and provide medical examinations and appropriate detection devices. Further the proposal provided that no employee would be required to perform work which endangered his health or which violated health and safety rules. Williams joined the negotiations at the evening session and discussed cleaning up the plant and the possibility of a federal inspection.

Kriska then turned to the Respondent's proposal which contained significant changes. One proposal was to extend the probationary period from 90 calendar days to 180 working days; another would authorize the Company to lay off employees without regard to seniority for 10 days rather than 24 hours; and a third provided that employees who were on medical leave for more than 6 months could be terminated from service. The Union opposed the proposals viewing them as a way by which Respondent could avoid responsibility for the health of its employees. Specifically, the union team suspected that the Respondent wanted to extend the probationary period so that it could employ individuals known in the trade as ''jumpers,'' migrant workers who travel from one nuclear facility to another to handle emergencies. The Union also viewed the 10-day layoff proposal as a way to remove employees with high exposures. The parties remained deeply divided over these proposals throughout the negotiations.

The next three meetings on March 25, and April 8 and 9 were devoted largely to a clause-by-clause discussion of the various contractual proposals. The Respondent's notes of these sessions indicate that Abel designated any provisions which dealt with wages or other financial benefits as economic proposals and insisted that the parties complete negotiations on the noneconomic issues before turning to them. Abel testified, however, that he plainly indicated that the Union had no problem with the economic terms. Although the Union did not accept Respondent's economic proposals, it is reasonable to assume that a skilled and experienced negotiator like Kriska, knowing that the TNS wage proposal was extremely generous, would perceive that the Union representatives were merely reserving discussion on the wage hike and not rejecting it.

During the April 8 meeting, Abel vehemently opposed the Respondent's effort to extend the probationary period from 90 calendar to 180 working days, characterizing it as a ''strike issue.'' Abel also urged TNS to adopt OCAW's health and safety language. The notes of this meeting do not reflect the TNS reaction.

On April 9, the parties attempted to narrow the issues by deciding where there was agreement on matters such as overtime, dues checkoff and the grievance and arbitration procedure, and where differences remained. Abel continued to resist dealing with the economic proposals, but stated several times that he did not think the parties were far apart on such matters. However, the the Union strongly objected to Respondent's proposals for the extended probationary period and 10-day temporary layoffs. Kriska observed that the safety issue remained open and urged that the parties carefully consider each other's proposals.

After a 2-week interval, negotiations resumed on April 24. One member of the union team began the meeting with an angry denunciation of Respondent's failure to address safety problems. Abel accused Respondent of ''burning out'' the young workers. Employee Charles Carson complained about the misuse of respirators. Both sides agreed that matters were

[156] The account of these negotiations is drawn principally from notes maintained by Respondent and introduced into evidence as R. Exh. 290. The notes indicate that the Union's bargaining committee included Abel, Bettis, and various employees, not all of whom attended every meeting. From time to time, District Director Williams participated. The Respondent's chief negotiator was George Kriska. He assisted by George Christensen. Respondent's industrial relations assistant, J. Craig, took minutes and Moger attended on a sporadic basis.

[157] The employees were Paul Pierson whose urinalysis results for March 2 and April 13 were 240 and 310 ug/l, respectively, and Frank Gillespie, whose bioassay test scores on March 2 and March 16 were 2,200 and 490 ug/l respectively.

growing very tense at the plant. The Union was particularly angry that several employees had been suspended and management countered that vandalism was occurring. Again, the negotiators reviewed the various clauses article by article, reaching tentative agreement on some but leaving open such issues as management rights, checkoff, shift assignments and vacation scheduling. The parties remained far apart on the probationary clause and the 10-day layoff proposal. The Respondent insisted that the 10-day layoff would be used when there were equipment failures or material shortages but not where employees had excessive uranium exposures. However, when the Union negotiators asked the Respondent to expressly limit the proposal solely to non-health-related purposes, the Respondent refused to do so. Recognizing that 180 working days would stretch the probationary period to 7-1/2 months, the Union continued to resist this proposal.

When Williams rejoined the negotiations on April 9, he castigated the Company for maintaining intolerable conditions including the forced use of respirators. He stated that without relief on these matters there could be a health and safety strike and asked that OCAW's physician, Dr. Nelson, and other health and safety personnel be permitted to inspect the plant within the next 10 days. Respondent expressed its opposition to the Union's health and safety proposal contending, for the first time, that it would abrogate management's right to operate the plant. The meeting concluded on a hostile note with Abel warning that a health and safety strike would occur on April 30.[158]

In an effort to address the various health concerns raised by the Union negotiators at the preceding meeting, the Respondent invited RSO Barlow to the April 25 session which focused entirely on health matters. Williams began by again condemning the Respondent's respirator practice and its suspension of employees who were unable to wear them. Christensen interjected that the Company had no choice but to use the respirators. Barlow added that the respirators were put into effect as a temporary solution until such time as engineering controls could reduce the airborne contamination produced by the grinders. When Barlow indicated that the employees had been wearing respirators for 2 months,[159] Williams erupted in an angry tirade that ''We are not going to work under those conditions.'' (R. Exh. 290 f at 4.)

After Williams' outburst, Christensen asked Barlow if it was necessary for all the grinder operators to wear respirators. Barlow answered: ''The nose and finishing grinders are approaching trends that may allow them not to wear them all the time. The rough and finish OD grinders are still showing trends of being high.'' (R. Exh. 290 f at 5.) When Williams asked why the Company did not isolate the grinders, Barlow agreed that this would bring about considerable improvement. Christensen then promised to enclose the grinders. Williams also railed against conditions in the lockerroom and the fact that penetrator shop operators had been suspended when they would not wear their respirators.

The last 3 meetings held prior to the strike were under the aegis of the Federal Mediation and Conciliation Service. The first meeting in this series began on April 27 with Union and Respondent negotiators reviewing their proposals to determine whether further progress could be made. Both parties offered a number of counterproposals which resolved some of their differences. However, although the Respondent reduced the probationary period proposal from 180 to 120 working days, and the Union tendered a counteroffer of 40 rather than 30 calendar days, they remained apart on this issue. In addition, the Respondent did not revise its position on a 10-day layoff period, and refused to assent to the Union's health and safety proposal. Kriska stated that the Respondent would agree to an independent evaluation of the TNS safety program by an internationally known radiologic and safety consultant, and asked the Union for recommendations. Williams responded that the Union had its own experts and also suggested that NIOSH, (the National Institute of Occupational Safety and Health) had available experts. When Williams insisted that the Union was entitled to accompany such experts, Kriska responded that Respondent had no objection to the presence of a Union representatives.

The next day, the parties met briefly and compromised on several additional matters. However, the meeting ended early on a pessimistic note with the Union stating that they regarded negotiations as a waste of time and requesting that the Respondent submit its final offer the following day. On April 29, as requested, Kriska presented the Respondent's final proposal to the Union, stating that they still were far apart on many issues and would be unable to resolve their differences. Williams replied, ''our biggest problem is health and safety.'' He again accused the Company of trying to buy a contract with an attractive economic package but that they were ''still $2.00 low.'' (R. Exh. 290 i at 3.) Continuing with his tirade, Williams stated that ''you have overexposed everyone at this table and everybody at the plant. . . . They (the employees) have been working in sweat shop conditions.'' (Id.) Employee Randy Garland added, ''You don't have enough money to make me work there.'' (Id.) At this point, although the Union had not formally accepted the economic offer both Abel and Williams recalled that they indicated to the Respondent that the wage proposal was not a problem. The parties continued to differ over certain seniority revisions, the length of the probationary period, the 10-day layoff, and the Union's health and safety proposal.

F. *The Strike Vote*

When the TNS Local began holding separate meetings, a portion of each agenda was devoted to discussing health and safety conditions at the plant.[160] By the latter part of April

[158] As the meeting ended Abel accused the Respondent's recording secretary of failing to take notes whenever the Union raised health and safety topics. Abel and Bettis repeated this accusation at the hearing. Kriska acknowledged that the notes introduced as R. Exh. 290 were not verbatim and that on occasion, the recording secretary was unable to take accurate or detailed notes when overlapping conversations took place.

[159] In fact, the mandatory respirator practice had been in effect for 3 months by that date.

[160] Ricky Decker attended some five or six union meetings prior to the strike and recalled that at each one, Local President Bettis reviewed the joint health and safety committee reports and related that management invariably promised to take care of matters as soon as possible. Decker testified that ''everyone was getting irritated because nothing was being done.'' Recurring topics at these meetings concerned the dirty state of the changeroom; the ineffectiveness of the dust collectors and downdraft tables; unanswered questions about how much radiation the employees were receiving, why they were

Continued

1981, with little progress made toward negotiating a successor labor contract, two special union meetings were held which, according to the employees, focused almost exclusively on their health concerns and paved the way for the work stoppage.

Some 50 to 60 employees attended the first such meeting on April 4.[161] Witnesses who attended this meeting were in substantial accord about what occurred.[162] They stated that the bulk of the meeting was devoted to reviewing the progress of negotiations and then discussing various health and safety conditions in the plant. According to employees Innello, Lenoir, Richardson and Decker, the workers were aware that management had made a generous wage offer which most of them found satisfactory.[163] However, as Lenoir testified, ''what good is money if you are not going to live long enough to enjoy it.'' By secret ballot, the employees voted to authorize a strike.[164]

The entire work force attended 1 of 2 meetings on April 29 held to consider the Company's final proposal. Many employees used the meeting as an opportunity to share their concerns about working conditions in the plant. Rimel, who had not considered herself a union activist and had not attended past union meetings, went to this last one. Although initially she had not intended to vote for a strike, after hearing her coworkers' complaints, she joined in the unanimous vote approving the work stoppage. Ricky Decker and Gary Reed corroborated Rimel's account of the final meeting with Reed describing it this way: ''On the last date when they took the final strike vote, we all discussed the unsafe dirty conditions in the plant and decided we needed to do something if we were going to work there. We had to do something to get it cleaned up.'' Employees Decker, Garland, Garst, and Johnson stated their understanding that the final vote was on whether to accept the Company's offer or to engage in a strike for health and safety reasons. Decker stated that the employees considered management's request for more time to clean up the plant but decided that the Company already had ample time to do so; noting that the health and safety matters requiring attention had increased, not abated. Decker added that a number of people at the final meeting were disturbed that they could not get their questions answered about possible overexposures. on hearing that management was adhering to its 10-day layoff proposal, Decker stated, ''We felt expendable.'' Brad Richardson expressed his reaction to the situation this way: ''If we could have got the Company to agree to give us a safe place to work I would have voted to work.''

At the hearing, every employee witness called by the General Counsel testified as to the reasons which led him or her to participate in the work stoppage. They described a litany of complaints which while repetitive, nevertheless sounded earnest and unaffected. Randy Garland may have expressed the position of his coworkers best when he stated that he hoped the strike would force the Respondent to clean the plant and correct the air quality problems there. A few employees, presented by the Respondent, suggested that health and safety was not the principal concern. Thus, employees Thomas Tipton, Jean Smith, and Robert Rhines testified that some of their coworkers told them that the strike would be for higher wages or that they saw the strike an an opportunity for a holiday or to go fishing. No direct evidence was adduced to directly contradict the testimony offered by these witnesses and it may be that some employees had personal reasons for joining in the work stoppage. However, the overwhelming weight of the testimony establishes that the employees rejected the Respondent's final proposal and voted to strike because they believed that the working conditions at TNS were endangering their health. If the employees actually were concerned about higher wages, as the Respondent contends, then surely that issue would have figured prominently in negotiations prior to the strike. Instead, the record shows that the Union expressed no real concern about Respondent's economic proposal in apparent recognition that it was not troublesome.

Respondent attempted to impeach the employees by introducing into evidence answers to interrogatories signed by some of the employees in December 1983 as part of discovery in a pending tort action.[165] The identical question was posed in each interrogatory: ''When did you first become concerned about work environment, safety and health at TNS, Inc.?'' Every plaintiff submitted this carbon-copy reply:

> In December of 1981, Dr. Karl Morgan reviewed the records of some of the workers at TNS and expressed his opinion that there was some concern for workers at TNS regarding excess risk of cancer. On that date or shortly thereafter it became a matter of concern for most workers at TNS regarding the future health problems that they may have. . . . Some time after December 8, 1981 I did become aware of the increased possibility of cancer as a result of my exposure. (R. Exh. 34 at 6.)

Clearly, the answers given to this interrogatory contradict the employees' virtually unanimous testimony at the trial that they became aware of the dangerous risks of cancer before the strike began. Dr. Nelson's meetings with the employees shortly after the strike commenced, the Gore Committee hearings and the '' Sixty Minutes'' TV program served to expand the employees' understanding of the health risks at TNS long before they answered the interrogatories. Since their answers to the interrogatories were identical and were expressed in polished, articulate terms, it is obvious that the employees adopted language prepared for them, presumably by their counsel in the District Court action, apparently unmindful of the inconsistencies between their answers in that

---

being transfered from their regular jobs and required to submit urine samples over the weekend.

[161] Of the approximately 100 workers in the plant, 96 were union members.

[162] Thomas Tipton, a current employee called as a witness by the Respondent, testified that he attended a meeting supposedly held a month or so before the strike at which the employees were asked to contribute their suggestions for contract proposals. Contrary to Respondent's contention, it is clear that Tipton was not speaking of the April 4 meeting but rather was referring to an earlier meeting.

[163] Respondent mailed a copy of its wage proposal to each employee during the course of negotiations.

[164] The OCAW constitution requires a strike authorization vote by 75 percent of the Local's voting members as a prerequisite for receipt of strike benefits. A prestrike vote does not necessarily commit the employees to a strike.

[165] *Bettis et al v. Aerojet Ordnance Co.* (Civil Action No. 2-82-175, E.D. Tenn.)

case and their testimony in the unfair labor practice proceeding. Without speculating on the reasons why these legally untutored employees would endorse answers to an interrogatory which contradicted their experience, I am convinced that they did not dissemble in the instant hearing about their motives and reason for striking.

The Strike Commences

When the work stoppage began on May 1, 1981, the striking employees began picketing the facility. They carried placards, one of which depicted a cow's skull with a legend reading ''One drink from the TNS pond did this to me.'' Another announced that the Local was striking for ''safer and better working conditions, while a third stated simply that OCAW was striking over unfair labor practices. Initially, articles about the strike appeared frequently in local newspapers. Under a May 1 dateline, one such story quoted Union representative Abel as saying that while wage proposals were ''not that far apart. . . . one of the biggest reasons we're here is the adverse, unhealthy working conditions that we have been exposed to, without regard for our health and safety.'' (R. Exh. 9.) Months later the newspapers also carried reports of the Congressional hearings before the Gore Committee. Respondent also introduced into the record of the Gore Committee hearing, newspaper articles which reported on strike misconduct and violence.

Before the strike began, Dr. Mark Nelson, was advised that health was a pivotal issue in the negotiations, and was asked to meet with the workers. During his first visit in the second week of May 1981, he met with approximately 30 to 40 strikers at a tent pitched near the picket line. At this time he talked to workers in general terms about the potential adverse health effects of uranium. He listened to the strikers as they voiced many of the same concerns and complaints about which they testified in this proceeding. After the employees received their bioassay records, Dr. Nelson returned to the strike site in the latter part of July and spent several days discussing the significance of their test results with them.

VII. POSTSTRIKE EVENTS

A. *Poststrike Collective Bargaining*

With the strike in its fourth week, the parties resumed bargaining on June 3. On this occasion, Steve Wodka, a special delegate from the International Union's Health and Safety Department, presented a written health and safety proposal which sought 2 commitments from the Respondent: first, an end to the full-time use of respirators by December 1, 1981; and second, a plant inspection by an independent industrial hygiene consultant, paid for by the Respondent, who would make recommendations on health and safety hazards.

Kriska denied that a major health problem existed and would give no firm commitments to the Union. Instead, he stated that the Company would continue to correct operational problems and that the Respondent would discontinue the use of respirators when it believed it was safe to do so.

During this meeting, Christensen admitted that air contamination, caused by production pressures, was beyond acceptable limits in some areas of the plant but stated that Respondent had a plan to correct the problem. Moreover, since TNS had its own health experts, he saw no need for an independent consultant unless the Union shared the cost. Neither Christensen nor Kriska revealed that Respondent had received the RMC report.[166] Wodka argued that it was the Company's obligation to provide a safe working place and that neither the Local nor the International could afford the $5000 to $20,000 a consultant might charge. As the meeting concluded, Able and Bettis bitterly contended that the Respondent was treating the work force with contempt and that the employees were more committed to the strike than they were when it first began.

At Respondent's request, Kriska and Moger met in Denver on July 6, 1981, with Robert Goss, the International Union President and Able in an effort to reach some compromise before the Company began hiring replacements.[167] The TNS officials assured Goss that the plant had been inspected ''and that there was no imminent danger to the employees' health,'' an apparent reference to the TDRH May inspection of the facility. Again, they withheld the existence of the RMC report from the Union. Also, they failed to acknowledge what they knew to be the fact, that many aspects of the health and safety practices at TNS were ''substandard.'' (G.C. Exh. 9 at 105–106.)[168] After conferring by phone with his Union colleagues in Tennessee, Goss advised Kriska and Moger the following day that feelings were too intense to resolve the matter without firm commitments from the Respondent to correct health and safety deficiencies.

Following the failure of the Denver meeting, the Respondent sent letters dated July 8, 1981, to all striking employees notifying them that the Company would begin recruiting permanent replacements the following week.[169] When neither the Union nor most of the striking employees answered this letter, the Respondent began hiring new employees and reopened the plant in early August.[170]

When negotiations resumed on July 16, 1981, the parties met in separate offices relying on the mediator to shuttle their respective positions back and forth. The mediator informed the Respondent's bargaining committee that the Union was concerned with correcting conditions in the plant, with revising health and safety contract language and was continuing to press for acceptance of its health and safety proposal.

---

[166] This report, discussed supra (part II,V,A), contained certain important criticisms of health and safety conditions at the TNS plant.

[167] Kriska stated that TNS felt obliged to reopen the facility because the United States Air Force was insisting that Respondent meet its contractual obligations. However, Respondent reopened only the foundry in August and never resumed penetrator production at TNS. Therefore, it is unclear from this record how the resumption of foundry operations served to meet the alleged demand for the GAU-8 penetrator.

[168] Richard O'Brien testified at the Gore Committee hearing that at the time of negotiations, management knew of health and safety problems. He candidly confessed to the Gore Committee that ''deficiencies . . . existed, we admitted those deficiencies—maybe not to the union, but we admitted it to ourselves.'' (G.C. Exh. 9 at 121.)

[169] The letter stated inter alia:

> With the strike almost ten (10) weeks long and no end . . . in sight, the company has decided to resume some of the plant operations because of their importance to the country's national defense. Also we have been thoroughly inspected and advised that our employees face no imminent health-safety danger.'' (R. Exh. 12.)

[170] Additional groups of replacement employees were hired in September 1981 and in March and April 1982.

When the parties met face to face later in the day, Abel officially accepted Respondent's economic package and proposed several other conciliatory counteroffers, but insisted that the Union had to have relief in the health and safety area. In fact Abel indicated that only two key issues—health and safety and the temporary layoff—were preventing an end to the strike. OCAW also sought a commitment that TNS would be a safe place to work and sought a date certain when the full-time use of respirators would be terminated. Moger stated that the Respondent was unwilling to alter its final offer and, consequently, believed that the parties were at an impasse.[171]

The July 16 session ended in the early morning hours and, after a brief recess, continued the following morning. After again insisting that the plant was safe, Kriska asserted that the Respondent would not capitulate to OCAW's health and safety language, thereby permitting the Union to usurp management rights. When the discussion turned to the 10-day layoff proposal, the Union suggested that the clause be amended to apply solely to operational emergencies. The Respondent's negotiators insisted that the clause had never been used as a device to layoff overexposed personnel. Compromising somewhat, TNS offered to limit the language of the proposal so that it would apply only once within a 6 month period and exclude from its reach any employee with a high lung count. However, it would continue to apply to employees with excessive uranium-in-urine results. With neither party willing to yield further, the negotiations concluded without resolution of the health issues.

On September 3, the parties met again under the same roof but in separate rooms. The Company indicated that it had completed hiring replacements, whereon the Union asked about the employment status of the strikers. Moger answered that no jobs were available for any of the striking employees. When Moger refused to meet privately with Joe Misbrener, OCAW's International Vice President, the session concluded on as ''black and grim'' a note as it had begun. (R. Exh. 290 l at 2.)

In December 1981, with the strike in its eighth month, collective-bargaining negotiations at a standstill, and replacement employees filling all available jobs, some of the employees nevertheless found that their resolve to continue striking was strengthened after watching a videotape of the Gore Committee hearings. Employees recalled that Dr. Morgan and Dr. Nelson, among others, testified before the Committee that they regarded the workers' exposures as excessively high. The former strikers expressed mI. Exh. ed reactions on viewing a segment of a television program, ''Sixty Minutes,'' which focused on the strike at TNS. Some were frightened by what they heard; others were heartened that their plight was receiving national attention. In preparing for this program, a reporter interviewed various workers, including one Albert Patton, an employee who had been discharged by TNS in March 1981 allegedly for drinking, and who, by the time the program aired, was dying of leukemia. In response to a question from the television reporter, Patton stated that he believed his illness was caused by conditions at work.[172]

Respondent called as its witness, a longtime friend of Patton's who testified that Patton told him that he did not believe his leukemia was occupationally induced. Employee Brad Richardson, testified with simple candor that while he still did not understand much about radiation, after seeing Patton on '' Sixty Minutes,'' he felt ''scared'' since he and Patton had worked at TNS an equally long time.

Although encouraged by the national media attention given to the TNS strike, by February 1982, the strikers recognized that the negotiations had failed to resolve their concerns and learned that an unfair labor practice charge filed by the International Union had been rejected by the Board's Regional Office.[173] Consequently, on February 15, the Union submitted to the Respondent an unconditional offer to return to work on behalf of the employees. In telegraphic reply, the Respondent stated that replacements had been hired and that no job openings were available.

B. *The Respondent Refuses to Bargain*

After the employees offered to return to work, 2 more bargaining meetings were held, with the mediator again transmitting messages between the parties assembled in separate caucuses. At the first session on March 4, 1982, the Union proposed that the Company resume penetrator production and take back the striking employees although the Respondent maintained it was not legally obliged to do so. Thereafter, the Union presented an 11-point program containing the following: that the Company's proposed 10-day layoff be reduced to 5 days, that it be invoked no more than once every 6 months and be limited to machinery breakdowns or power failures; acceptance of the Union's last health and safety proposal; a guarantee that the Local Union president be accorded time off to attend meetings; a checkoff clause to be included in the contract; acceptance of the Company's compromise proposal for a 90-working-day probationary period; a bidding procedure to be established for any new job which required training; a 2-year term for the agreement with a $1 wage increase after the first year; and acceptance of all other Company proposals.

Confident that TNS had won the strike, Respondent's counsel, William Earnest, expressed disappointment with the Union's positions. The meeting concluded with TNS asking that the Union furnish certain documents to clarify items in its latest proposal. Prior to the next meeting on April 6, the Union supplied the Respondent with the requested material. However, that entire session was consumed by a fruitless discussion of whether the penetrator shop would reopen. The Company made no response to the Union's 11-point proposal.

---

[171] Kriska and Moger also advised the union representatives that the penetrator shop would remain closed indefinitely for there was no need for further production of the GAU 8 core.

[172] Patton had been employed at TNS since 1974, spending considerable time in the thorium bay. Dr. Lushbaugh testified that Patton's leukemia could not have been caused by his exposure to thorium. Cole also maintained that if Patton had been exposed to excessive amounts of thorium, his in-vivo scan would have indicated the presence of a large amount of actinium. Since actinium was not present in his scan, Cole concluded that exposure to thorium did not cause Patton's leukemia.

[173] After OCAW successfully appealed the Region's decision to the Board's General Counsel, the charge was reinstated and a complaint issued.

Another meeting was planned for early May 1982, but before it took place, the replacement employees at TNS filed a decertification petition with the Board on May 3. On the same date, Sparks received a petition signed by 70 of the 73 current employees at TNS which stated that they no longer wished to be represented by OCAW or the Local. Since that time, and based on these events, Respondent has refused to meet with the Union, although on October 29, 1982, the Union requested that negotiations resume.

C. *The Alleged 8(a)(1) Violation*

In the several years since the plant reopened, the Respondent has recalled 12 of the striking employees. Gary Reed, one of those who was rehired, testified that in September 1983, he attended a meeting at which Dr. Schell explained that any reinstated striking workers would return with their original seniority intact and apologized to the assembled workers for having informed them to the contrary at an earlier time. Apparently responding to the replacement employees' continued apprehension about the seniority status of the reinstated workers, supervisor Frank Ward met with some 40 to 50 employees and repeated Dr. Schell's retraction regarding thge seniority status of the reinstated strikers. Ward explained that TNS was required as a matter of law to recognize the original seniority date of the returning strikers. Based on Reed's testimony about these remarks, the General Counsel's motion to amend the complaint to allege an independent violation of Section 8(a)(1) was granted.

PART THREE: ANALYSIS AND CONCLUSIONS

I. THE SECTION 502 ISSUES

A. *The Employees Engaged in a Work Stoppage Believing in Good Faith That Working Conditions Were Abnormally Dangerous*

1. Overview

To briefly recapitulate, the gravamen of the amended complaint is that Respondent violated Section 8(a)(3) and (1) of the Act by permanently replacing and, on their offer to return, refusing to reinstate, employees who engaged in a work stoppage, believing in good faith that their working conditions were abnormally dangerous due to ''long-term exposure to unprecedented levels of uranium dust in conjunction with inadequate health and safety programs . . . .''

These allegations and Respondent's answers frame the following pivotal issues: (1) whether the employees held a good faith belief that their working conditions were abnormally dangerous; (2) whether the employees' belief these that conditions were abnormally dangerous was supported by objective ascertainable evidence; (3) whether Section 502 of the Act protects employees when they strike over abnormally dangerous working conditions at the expiration of their collective-bargaining agreement; and (4) whether Respondent was required to reinstate the strikers on their unconditional offer to return to work.

As explained in greater detail below, I conclude (1) that the employees commenced and continued their work stoppage as a good faith protest of abnormally dangerous conditions at their place of employment; (2) that objective evidence supports the employees' belief that their working conditions were abnormally dangerous; (3) that Section 502 protects employees, such as those at TNS, who engage in a work stoppage over abnormally dangerous conditions at the expiration of their collective-bargaining agreement, having failed otherwise to persuade their employer to cure the abnormally dangerous conditions and (4) that employees who participate in a Section 502 work stoppage are not economic strikers who may be permanently replaced; rather, they are entitled to remedies analogous to those available to unfair labor practice strikers.

2. Standards of proof under Section 502

A synthesis of relevant precedent reveals that the following criteria must be met if employees who have withheld their labor because of abnormally dangerous working conditions are rightfully to claim the protections of Section 502: The General Counsel must prove by a preponderance of the evidence that the employees believed in good faith that their working conditions were abnormally dangerous and that their belief was the cause of the work stoppage; that ascertainable, objective evidence supports the bona fides of the employees' belief; that the dangers must be greater than those which would normally existed in the work place and posed a presently existing threat which affected all of those who engaged in the work stoppage. The cases from which this synthesis is drawn are discussed below.

Clear authority establishes that the employees' good faith belief, based solely on subjective evidence, is inadequate to establish a claim under Section 502. A subjective inquiry into the employees' state of mind was rejected in *Redwing Carriers*, 130 NLRB 1208, 1209 (1961),[174] where the Board announced that the proper test of good faith would be:

> an objective as opposed to a subjective test. What controls is not the state of mind of the employer or employees concerned, but whether the actual working conditions shown to exist by competent evidence might in the circumstances reasonably be considered abnormally dangerous.

The *Redwing* standard, consistently applied by the Board in Section 502 cases,[175] was endorsed in *Gateway Coal Co. v. Mine Workers*, 414 U.S. 368, 386–387 (1974). There, to avoid a ''wholly speculative inquiry into the motive of workers,'' the Supreme Court insisted that an employee seeking to obtain the protections of Section 502 must present ''ascertainable objective evidence supporting his conclusion that an abnormally dangerous condition for work exists.'' Id. at 386–387.[176]

---

[174] Enfd. as modified 325 F.2d 1011 (D.C. Cir. 1963), cert. denied 377 U.S. 905 (1964).

[175] See, e.g., *Custodis-Cottrell, Inc.*, 283 NLRB 585 (1987); *Richmond Tank Car Co.*, 264 NLRB 174, 176 fn. 2 (1982), enf. denied on other grounds 727 F.2d 499 (5th Cir. 1983); *Combustion Engineering*, 224 NLRB 542 (1976).

[176] The Supreme Court cited *NLRB v. Knight Morley Corp.*, 251 F.2d 753 (6th Cir. 1957), cert. denied 357 U.S. 927 (1958), as one of the authorities supporting this objective standard, although in *NLRB v. Fruin-Colnon Construction Co.*, 330 F.2d 885 (8th Cir. 1964), the court of appeals criticized the *Knight Morley* court for applying what it considered to be a subjective standard.

The Respondent insists that Section 502 imposes a danger-in-fact test and, at times, appears to suggest that actual harm must be demonstrated. The Court of Appeals for the District of Columbia decided otherwise in *Barnyard v. NLRB*, 505 F.2d 342 (D.C. Cir. 1974). There, the circuit court ruled that the Board wrongly adopted an arbitral decision which incorrectly applied a ''safe-in-fact standard'' in deciding that an employee's refusal to drive an allegedly defective truck was unjustified. Id. at 348. The court of appeals discounted the fact that the truck subsequently was driven without repairs, stating that ''evidence of what happened after the employee's refusal . . . is irrelevant to whether there was suitable ascertainable objective evidence supporting a justified conclusion that an abnormally dangerous condition existed.'' Id. Accord: *Philadelphia Marine Trade Assn.*, 138 NLRB 737, 753 (1962)[177] (''the nature of the risk is not altered by the fact that one group takes it and another declines''). Accordingly, the court remanded the case, observing that ''Under the more liberal *Gateway Coal* standard the Board might have concluded that (the driver's belief that the tractor was unsafe was amply supported by 'ascertainable objective evidence.''' Id. On remand, the Board found that the truckdriver had evidence ''objective enough to lead a person to reasonably determine that he should not drive such a truck.'' That others considered the truck safe did not negate ''the reasonableness of his belief under the circumstances.'' *Roadway Express*, 217 NLRB 278, 280 (1975).

These cases instruct that evidence of the employees' good-faith belief is required, but that however honest, it is insufficient to support a finding of abnormal danger unless accompanied by objective evidence which establishes that the employees' perceptions were reasonably based on verifiable grounds. However, where there are probative facts which demonstrate that employees have an objective basis for their good-faith belief that their working conditions are abnormally dangerous, a claim that the employees' work stoppage comes within Section 502 is not necessarily undermined simply because there is some other evidence which tends to point another way or because the employer interprets the facts differently. See *Roadway Express*, supra at 28. While the General Counsel bears the burden of showing that competent evidence supports the employees' good-faith belief that abnormal danger obtains, the applicable standard of proof is the normal one in NLRB and civil cases—a preponderance of the evidence. In most of the decided cases, expert testimony was presented to establish the extent or degree of danger. Such testimony was received in the instant case and assessed in accordance with the traditional standard of proof.

3. The meaning of abnormal danger

Decisional law interpreting Section 502 provides only limited guidance for determining when working conditions are ''abnormally dangerous.'' Employment conditions which are normally or even inherently dangerous will not fall within the abnormal classification. Working conditions which become no more than highly unpleasant also will not qualify. In *Anaconda Aluminum*, 197 NLRB 336, 344 (1972), the Board stated that ''work which is recognized and accepted by employees as inherently dangerous does not become ''abnormally dangerous'' because employee patience with prevailing conditions wears thin or their forbearance ceases.''

Affirming its position that abnormal danger requires more than the usual quotient of risk, the Board still recognized that Section 502 could be invoked when normally dangerous conditions become abnormally so. In *Richmond Tank Co.*, supra, a union steward was discharged after leading an employee walkoff to protest an ineffective derailing system which would not restrain runaway railroad cars from rolling into the employees' workplace. In finding that the walkout was protected under Section 502, the Board observed that ''work in and around rolling stock is and always has been hazardous. Here, additional danger of great bodily danger, easily curable through simple managerial and technological modification . . . converted a work place that was normally dangerous into one that was abnormally so.'' Id. at 176. Cf. *Daniels Construction Co.*, 264 NLRB 770 (1982) (employee properly discharged on refusing to enter a radioactive pipe, a task which was an occasional but routine requirement of the job and when no additional precautions would make that task safer). These cases also suggest that an employer's failure to abate a hazardous condition when abatement is possible, may be a factor in determining whether abnormally dangerous conditions exist.

These cases contain no definite criteria for determining how much greater than usual the risk of harm must be to convert a work place which is normally dangerous into one which is abnormally so. The trier of fact must determine from all the available evidence in the particular case whether there is competent evidence to support the employees' reasonable belief that abnormally dangerous conditions exist. At a minimum, it is clear that no one need be killed or even injured in order to prove that the workplace is abnormally dangerous. See *Fruin Colnon Construction Co.*, 139 NLRB 894, 905 (1962). Neither does any case suggest that the risk must be a sudden castastrophic event or involve a dire emergency.

4. Scientific underpinnings for the claim of abnormal dangers at TNS

To determine what magnitude of risk may be required to convert a normal danger into an abnormal hazard under Section 502 within the framework of the present case, a brief review of the scientific concepts which explain the relationship between radiation dose and corresponding biologic harm will set this matter in perspective. (See also discussion, supra at Part Two, A,2 and cited portions of *Allen v. U.S.*, supra.)

As previously discussed, the no-threshold view holds that at any exposure level, even at very low doses, ionizing radiation creates a long-term risk of cancer, leukemia and chromosomal damage in persons exposed and also may produce genetic damage in their offspring. No dose is so safe or so low that one may say categorically that exposure will cause no harm. Especially with high-LET radition (including alpha particles emitted by DU), the dose response relationship is presumed to be linear and cumulative; in other words, as the dose increases the incidence of cancer rises proportionately. Moreover, although the effects of ionizing radiation do not appear until many years after the radiation exposure occurs, actual injury occurs to some unknown degree at the time of exposure. Thus, the risk of harm increases each day that workers are exposed to DU.

[177] Affd. 330 F.2d 492 (3d Cir. 1964).

A latency period also exists between exposure to the heavy metal properties of DU and resultant chemically toxic effects on the kidney. However, most scientists believe that a threshold dose exists to such exposures below which no harm will occur as long as the expsoures are not chronic. At some very low level, the body apparently has a capacity to repair or replace injured cells as long as continued exposures do not occur.

The foregoing discussion serves as a reminder that persisitent exposure to low levels of DU poses some degree of radioactive and chemically toxic risk. Consequently, under the best of ordinary circumstances, TNS was a hazardous place to work. Where the risks of harm are cumulative and increase in some proportion to the dose received, when does an ordinarily dangerous worksite such as TNS become abnormally dangerous within the meaning of Section 502?

5. Relevance of regulatory standards

In answering this question, I now turn to the regulations of the agency to which Congress entrusted the task of setting norms for acceptable risks to workers. The NRC standards, on which TDRH modeled its own regulations, were not intended to represent levels of exposure at which no injury would be inflicted; they draw no bright line between what is safe and unsafe. They simply reflect a socio-political judgment that a selected level of risk for employees is acceptable when balanced against benefit to society.

Generally speaking, the administrative regulations fall into 2 categories: those which set operational codes (e.g., requirements relating to measuring devices, training, recordkeeping and reporting) and those which control received doses by setting ceilings on air quality and personnel exposures for workers and the public. Of course, the ten-fold difference between standards for workers and the public does not suggest that the worker is less at risk from the effects of uranium than is the public. Rather, the greater risk imposed on the employee reflects a presumption that those who are ''properly informed of the nature and magnitude of the risk'' willingly accept the occupational hazard not exceeding permissible limits as a trade off for wages. *Silkwood v. Kerr McGee Corp.*, 485 F.Supp. 566 (D. Okla. 1979), affd. in part revd. in part 667 F.2d 908 (10th Cir. 1981), revd. 464 U.S. 238 (1984), rehearing denied 465 U.S. 1074 (1984). Recognizing that exposure ceilings do not represent a risk-free threshold, Federal and state regulations require licensees to reduce exposures in accordance with ALARA. Although ALARA sets no specific minimums, it is no mere hortatory expression, since it appears as an enforceable regulation at the outset of the Federal regulations (10 CFR 20.1(c)).

I can conceive of no more objective means to assess whether the TNS employees were subjected to abnormal dangers than to examine the evidence in this case in light of the administrative standards. Deference to the guidelines and regulations of the NRC which, in turn, are founded on recommendations of expert scientific bodies in setting standards for the health and safety of workers and the public, is a ''careful accommodation of one statutory scheme to another.'' See *Southern Steamship Co. v. NLRB*, 316 U.S. 31, 37 (1942).

I do not imply that compliance or noncompliance with administrative standards conclusively resolves the question of whether the TNS employees were exposed to abnormal dangers. Section 502 was designed to protect employees before peril occurs. Hence, it would be error to find that abnormal dangers exist only when regulatory limits are exceeded, for then employees would be compelled to subject themselves to unacceptable levels of harm before invoking Section 502. A miner need not enter a coal shaft from which the smell of hazardous leaking gas is discerned in order to prove that the fumes would be seriously injurious or fatal. By the same token, if there are abnormal risks from exposure, determined by reference to scienitific findings, it is not mandatory that TNS employees prove that regulatory standards were consistently exceeded in order to establish that they were threatened by abnormally dangerous working conditions (especially when the evidence shows less than stringent data gathering and enforcement of standards by the regulatory agencies involved). While deference to the scientific standards of a sister agency is appropriate, such deference cannot displace the ultimate duty to determine whether work stoppages over abnormally dangerous conditions entitle employees to the protection of the Act.

B. *Standards of Proof Applied to Facts of this Case*

1. The employees' good faith

By ignoring the employees' repeated requests to correct conditions in the plant, by its conduct at the bargaining table, refusing to grant any legitimacy to the Union's health and safety proposal and posing substantive terms which appeared to further erode employee health protections, the Respondent confirmed the employees' worst fears: that their intractable employer was indifferent to their concerns about dangers in the work place. Having exhausted every peaceful avenue of redress, the TNS strikers had no recourse other than to cease working.

In concluding that the employees believed in good faith that their working conditions were abnormally dangerous and that this was their motive for striking, I rely on the employees' credited testimony together with other independent evidence discussed below.

Undeniably, a number of unresolved issues were outstanding between Union and management at the time the contract expired, but the Respondent's wage package was not a divisive issue. Presenting no economic offer or counteroffer of its own, the Union's silence about the Respondent's wage proposal throughout the negotiations prior to the strike was, in itself, a tacit signal that the attractive offer was acceptable. Moreover, if mere displeasure with conventional contractual terms was all that was at stake, the employees simply could have rejected the Respondent's final offer and remained at work while their representatives continued to bargain.[178] Instead, as the employees uniformly attested, they unanimously agreed to strike when the Respondent refused to commit to curing working conditions, in genuine fear that their health was at stake. They hoped, where all else had failed, that their actions would compel the employer to clean up the plant.

Some of the employees who voted to strike may have viewed it as an opportunity to do more than walk a picket

[178] Sparks' attendance at the April 27 and 28 negotiations also was not the insurmountable hurdle the Respondent claimed it to be, since the Union did not even allude to his presence throughout these sessions.

line. Several may have seen it as a chance to go fishing; others may have believed that the Respondent would offer an even more enticing wage package to lure them back to work. Certainly, TNS employees functioned with the same complex set of motives as other human beings. Individual interests may and often do coexist with high ideals and a common cause without extinguishing them. That various workers harbored personal plans during the strike does not negate the fact that together, a united work force shared an overriding preoccupation and operated with a single agenda.

Documentary evidence corroborates the genuineness of the employees' belief that abnormal dangers pervaded their work place. Reports of the joint health and safety committee show that for many months prior to the work stoppage, the Union registered repeated complaints about plantwide adverse working conditions. The Local's president issued a written ultimatum to management on March 10 which stated unequivocally that a strike would ensue if the itemized conditions were not corrected. This memo, which cited only one reason why a strike might ensue attests to the depth of the employees' frustration with the employer's dilatory conduct and establishes that the Respondent was warned well in advance of May 1 that the employees regarded health conditions in the plant as their sole, critical, nonnegotiable issue.

Just 2 weeks after the work stoppage commenced, RMC reviewed conditions in the plant at Respondent's request ''to determine if the operations were hazardous and to what degree'' because the Union believed that the depleted uranium operations were hazardous. Any contention that the employees fear of abnormally dangerous conditions was not at the core of this dispute is dispelled by Respondent's quick and closely guarded arrangement with the consulting firm.

In July 1981, the Union negotiators formally accepted the TNS wage offer; yet, the strike persisted. Clearly, even a $1-an-hour across-the-board wage hike did not tempt the employees to return to work either when it was first offered or after they had been on strike for several months, since they had obtained no concrete proof that the working conditions had been or would be corrected by a date certain.[179]

After Respondent advised the Union in September that no further vacancies would be filled, the strike dragged on for another 6 months, until in February 1982, the employees unconditionally offered to return to work. In the intervening months, the employees' beliefs, previously based on their perceptions and intuitive suspicions, were confirmed by the judgment of others. Specifically, Dr. Mark Nelson met with them in the strike tent headquarters and reviewed many individual employees' exposure records in a comprehensible manner.

The media, including local newspapers, as well as a filming crew from the TV program '' Sixty Minutes,'' showed interest in the strike and encouraged the employees to believe that their claims were being taken seriously.[180]

In December 1981, many employees gathered to watch a video tape of hearings before the GORE Committee and again heard Dr. Nelson discuss their high exposures. They also observed Dr. Morgan, introduced as a renowned health physicist, state that ''from the extremely high urine counts and from comments in the reports . . . it is evident that some of the operations at the plant are extremely dusty. . . . I can only conclude that there is a serious lack of conformance with good and accepted radiation safety measures.'' (G.C. Exh. 9 at 178.) Overall, Dr. Morgan found ''working conditions from the standpoint of health physics have been among the worst of any with which I am familiar.'' (Id.)

The employees' offer to return to work, submitted in February 1982, was a pragmatic acknowledgment of defeat, not an admission that their cause was unjustified. Given the Company's decision to permanently replace them and its announcement in September 1981 that it had no vacancies, the offer was a legal tactic intended to preserve reinstatement rights.

2. Good faith and ''presently existing'' danger

According to *Gateway Coal*, supra at 385, a Section 502 work stoppage must be in response to an immediate danger. The Court explained that by ''immediate,'' it meant that a Section 502 strike must address ''some presently existing threat'' Id. at 386. (Emphasis supplied.) Because the *Gateway* strike occurred when the miners lost confidence ''in the competency and integrity of their supervisors,'' the Court found that without more, the protest was not over a presently existing threat. Id. at 388. The Court did not state that an abnormally dangerous condition may not be longstanding or that the threat of harm must erupt suddenly, moments before the work stoppage. *Gateway* requires only that the threat of abnormal danger exist at the time the work stoppage occurs.

Only several cases since *Gateway* have touched directly on the issue of immediacy. One such case, *Mine Workers District 6*, 217 NLRB 541, 551 (1975), mirroring the situation in *Gateway Coal*, found no immediate danger from the continued employment of a mine foreman responsible for numerous safety infractions. In *Union Independiente de Empleados de Servicios Legales de Puerto Rico*, 249 NLRB 1044, 1055 (1980), the administrative law judge concluded that a fight between a union official and the employer's agent was not an event which reasonably placed employees in fear of imminent or forseeable danger.

Other than these few cases, no other precedents discuss what is meant by an immediate or presently existing danger. The reason for this silence is apparent. In almost every case applying Section 502, the immediate nature of the harm is evident from the particular facts involved. For example, in *Knight- Morley*, supra, the employees ceased working when the employer refused to correct a defective ventilator and the heat in the department rose to 110 degrees. In *Philadelphia Marine Trade Assn.*, supra, longshoremen struck when they were directed to unload a vessel using insecure devices; in

[179] The strikers received strike fund weekly benefits of $25, hardly enough to make the work stoppage a financially rewarding endeavor.

[180] The TNS employees who watched the TV program in the fall of 1981 heard fellow worker, Albert Patton, attribute the leukemia, which soon would cause his death, to his employment at TNS. Considerable testimony was adduced as to whether or not Patton's leukemia could have been due to his thorium exposure during the early years of his employment with TNS beginning in 1974. By the time observed symptoms of leukemia, or cancer are manifest, it is difficult to determine what the source of the disease might have been. However, the issue here is not whether conditions at TNS in fact were responsible for Patton's death, but whether his illness and his publicly expressed views of its cause (even if incorrect) provided a foundation for the employees' good-faith belief that their working conditions were abnormally dangerous.

Fruin-Colnon, experienced miners refused to work on observing at the outset of their shift that the mine shaft was excessively wet. In *Richmond Tank*, supra, workers walked off their jobs after their steward confirmed that certain equipment would not halt runaway railway cars. Conversely, where the hazard has abated, or was too remote or speculative, Section 502 did not lie. See, e.g., *Beker Industries*, 268 NLRB 975 (1983); *Union Independiente de Empleados*, supra; *Mine Workers District 6*, supra. Such situations do not require extended discussion as to the immediacy of the abnormal danger. Neither do they provide much guidance for the present controversy other than to establish that what is a presently existing abnormal danger or threat of abnormal danger must be defined in terms of the circumstances of the particular case.

Modern industrial experience instructs that not every threat or occurrence of bodily harm is as readily apparent as in the cases cited above. The dangers at TNS are a case in point. Clinically observable biologic damage from exposure to toxic agents may be long postponed. However, the risk from exposure is no less a presently existing threat than is the risk of defective equipment or hazardous weather conditions simply because the consequences are not visible until a latency period has intervened. Counsel for the Charging Party expressed the matter well in the following statement:

> Among the dusts, gasses, chemicals and metals of modern manufacturing processes are agents that are known to be dangerous to human health. The extent and degree of the danger often depends on the amount and duration of exposure, particularly when the harmful effects of the agents are cumulative. . . .
>
> The fact that conditions at a work place present health and safety problems the seriousness of which depends on long-term cumulative exposure to dangerous properties does not affect the analysis undertaken when workers claim the protection of Section 502. It is not the immediacy of the consequences but the immediacy and severity of the risk that are relevant.[181]

In the factual circumstances of the present case, immediacy is not defined in terms of long delayed biologic harm; rather, immediacy is tied to the degree of the risk and the likelihood of harm which continued, cumulative exposure to DU may produce.

Since under government regulations employees may be exposed to contaminants as a normal incident of employment, the problem becomes one of determining at what point in time employees may resist continued exposure under Section 502. The answer to this inquiry depends in part on when the employees should possess enough information to form a reasonable belief that their working conditions are abnormally dangerous.

To a greater or lesser degree, the TNS employees had a generalized notion that DU was responsible for radiation which could lead to cancer. But the most knowledgeable among them had little insight into how radiation affected the body and what the extent of the risk might be. Clearly, not one of them had any knowledge as to what amount of exposure might result in injury. Moreover, no one instructed the employees as to how to decipher their bioassay results or what their TLD badges and pen dosimeters meant. None appeared to understand the chemically toxic properties of DU and only a few appreciated that kidney damage might ensue.

Several of the TNS staff, most notably Sally Hock and Jim Barlow, made some effort to inform workers about hazards in the work place. At the same time, they, together with other personnel, including managers and foremen, undercut what litte instruction took place by failing to discipline employees to compel compliance with safe operating procedures. Worse still, they uttered reassuring and misleading remarks which so trivialized the possibility of hazard that the employees' sense of danger had to be dulled. In such a capricious setting, where the dangers were undetectable and no serious symptoms appeared to signal sickness, it is not surprising that the TNS employees continued, too long, to tolerate their working conditions while seeking redress from their employer.

At what point may it be said, then, that the employees' apprehensions had time enough to crystalize? The record shows that the employees' sense of danger gradually increased as a number of events took place in the several years prior to the strike. The importance of the employees' experience in California cannot be underestimated in alerting them that a more hospitable work place was possible. In addition, John Bettis, returned to the plant from Atomic Energy Council meetings as a proselytizer. Discussions of health conditions and management's failure to correct problems were discussed at Union meetings, as was Respondent's rejection of OCAW health and safety proposals presented during negotiations. These experiences awakened the employees' consciousness to unsafe conditions in their work place and set the stage for concerted action. To regard the expiration date of the collective- bargaining contract as a deadline, after which abnormally dangerous working conditions would no longer be tolerated, was a reasonable, responsible and patient approach to a serious problem which the Respondent refused to address.[182]

C. *Objective Evidence Sustains Employees' Good-Faith Belief*

1. Introduction

I turn next to the objective evidence introduced in this case. Measured against federal and state standards, the record contains ample evidence demonstrating that the TNS employees had good cause to protest their working conditions, for unprecedented levels of uranium contaminants at their work place subjected them to unacceptable risks of radioactive and chemically toxic biologic harm. In reaching this conclusion, I rely specifically on competent, objective evidence which establishes that (1) air quality at the facility exceeded MPC at 11 work stations for at least the last quarter preceding the strike; (2) the protracted use of respirators by a substantial

[181] G.C. Exh. 1xxx at 3.

[182] In retrospect, it is clear that the controversy over the so-called ''immediacy'' issue must be regarded as a red herring. The fact that some employees considered striking before the contract expired has no bearing on whether danger was ''presently existing'' at the time the work stoppage began. Indeed, that a number of operators considered an earlier walkout because of objectionable working conditions attests to the fact that this same reason continued to be an abiding, motivating force.

number of employees was deleterious to their health; (3) the employees' average whole body uranium exposures were far greater than those typical for the nuclear industry; and (4) that repeated and excessive uranium-in-urine levels indicated serious risk of kidney damage. I further conclude that these conditions came about and were not soon abated because Respondent failed to comply diligently with governmental codes prescribing sound health physics practices. The following sections of this decision will highlight the principal evidence which sustains the above conclusions. As discussed previously, when the long-lived alpha particle emitted by U-238 (the principle DU isotope) invades the human cell (primarily the lung), some portion of it will continue on its lethal mission throughout the host's lifetime. The only way to prevent the stealthy marauder from invading the organism is to prevent it from being inhaled or ingested in the first place. To protect the nuclear worker from such unacceptable risk, Federal and state regulations erect a three-tiered system: first, the cardinal tenet of health physics calls for controlling contaminants at their source through sound engineering design (i.e., enclosure of equipment) and adequate ventilation; second, ceilings are set to limit maximum permissible concentrations of contaminants in the air and surfaces of the work place; and third, users of radioactive and chemically toxic materials must carefully monitor the workplace and the worker in order to evaluate the extent of the hazard and, thereafter, take appropriate action to rectify excesses. The record in this case shows that there were serious breaches of these standards at TNS. By failing to meet its obligations under the regulatory scheme, Respondent subjected its employees to abnormally dangerous conditions.

2. Air quality exceeded MPC

As noted above, Respondent knew that the air quality at 11 work stations in the foundry and penetrator shop exceeded MPC for the 4 months prior to the strike. Since workers rotated jobs and moved about the plant in performing their assigned tasks, every employee was proximately exposed to the taint.

Respondent submits that violations of regulatory ceilings on MPC at TNS were too momentary to be taken seriously and may not be equated with abnormal danger, citing a portion of ICRP Report 30 to support its cavalier stance. In fact, ICRP 30 negates Respondent's position. The ICRP did not retreat from its recommended standards for air quality; it reaffirmed them as long as they were applied to average concentrations over a 13-week period. The ICRP's objection was to misusing those standards by invoking them for single or isolated incidents. Thus, in explaining why it was revising certain terminology used in a prior report, the commission stated:

> The Report (ICRP 2), has served as a satisfactory guide for the control of intakes of radionuclides into the body . . . although there have been some misconceptions about its intent and some misuse of its recommendations . . . . Although the Commission emphasized in *ICRP Publication 2* that the rate of intake of a radionuclide could be varied, *provided that the intake in any quarter was no greater than that resulting from continuous exposure to the applicable MPC for 13 weeks*, the concept of MPC has been misused to imply a maximum concentration in air or water that should never be exceeded. . . . [Emphasis supplied. R. Exh. 472 at 1.]

By no stretch of the imagination can ICRP 30 be read to imply that excesses above MPC for over a quarter, such as those which occurred at TNS in 1981, be considered monetary or treated lightly. The importance of maintaining air quality well below MPC is reflected in amendments to the TNS license submitted to TDRH in 1982 and 1983. As Respondent renovated its plant, new license amendments contained provisions requiring that operations in various sectors of the shop be supervised when daily air monitoring samples exceeded 50 percent MPC or weekly averages rose above 25 percent MPC.

3. Excessive respirator usage

Based on its air surveillance data and on a rash of employee exposures exceeding its own action levels, Respondent knew its equipment and ventilatory system were not adequately shielding its employees as required. Rather than halting production and renovating its equipment in a systemic way, Respondent opted for a less expensive course, muzzling many of its employees in respirators for months on end.

Federal regulations authorize respirator usage under certain limited conditions: the employer must comply on an ongoing basis with procedures specified in Reg. Guide 8.15, as amplified in NUREG 0041, and resort to respirators for only brief intervals as may be required by emergency situations if processing or other engineering controls are impracticable. Respondent flouted these conditions.

Failure to follow Reg. Guide 8.15 was no mere technical deficiency. If a healthy employee has difficulty in wearing a respirator for more than an hour, then it surely is not surprising that an employee with a breathing impairment could suffer debilitating and even hazardous consequences from the prolonged use for an entire shift, day after day. Consequently, Respondent's failure to medically examine employees or administer pulmonary function tests (as they did for replacement employees) to detect respiratory impairments before mandating the use of respirators, was a serious omission. Respondent's records establish that when employees were first fitted, suitable respirators were not available for approximately 26 of them. Moreover, even those who were issued respirators were not automatically afforded protection. Often the respirators were worn improperly, they developed leaks, they were ineffectively cleaned, the filters were not changed as required. Thus, employees both with and without respirators were assaulted and put at risk by elevated concentrations of airborne contaminants. Records show that 10 of 17 employees in the penetrator shop averaged uranium-in-urine levels over 30 ug/l for the entire quarter proceeding the strike though they were required to consistently wear masks. Regardless of the respirator's assigned PF factor[183] no one could assume that the emloyees were protected from abnormally dangerous exposures.

[183] The RMC report assumed that the respirators supplied the necessary protection factor. Since the consultant did not observe the employees at work wearing respirators, he obviously was referring to the theoretical protection provided by a mask under perfect conditions. Davis could not have know whether the devices, in fact, were defective or fit the wearer properly.

Doctors Morgan, Nelson, and Morrow, as well as Davis, observed that the Respondent should have anticipated the employees' distress from protracted respirator use. As Dr. Morgan commented, ''workers being forced to wear respirators and then failing to, or not wanting to, is understandable and a return to a bizarre era of inadequate and unrealistic worker protection.'' (G.C. Exh. 9 at 109.)

The DARCOM manual, on which the Respondent relied when it was expedient to do so, tracks Reg. Guide 8.15 in warning that prolonged use of respirators will drive employees to furtive methods to relieve their discomfort. Ignoring these admonitions, Respondent resisted making the sweeping and long-required modifications of its equipment until at least a year after the strike commenced. Making matters worse, during negotiations, TNS guaranteed no date for an end to the mandatory full-shift use of respirators.

Predictably, and with Respondent's knowledge, the employees cheated by failing to wear their respirators faithfully.[184] They can hardly be faulted. Their derelictions were slight when compared to those of the Respondent's. Rather than shielding the work force from abnormal dangers, Respondent's overdependence on respirators deprived the employees of the genuine safeguards on which their health depended.

4. The risk of kidney damage

Scientific experts uniformly agree that as a heavy metal, uranium compounds pose a serious threat to the life-sustaining functions of the kidney. However, the degree of exposure necessary to produce renal injury is disputed. To resolve this controversy, the NRC published for comment Reg. Guide 8.22 which set exposure limits to prevent kidney damage. Reg. Guide 8.22 was not formally promulgated and, therefore, did not have the force and effect of law at the time of the TNS work stoppage. However, the issue here is not whether Respondent violated a federal or state standard, but whether 8.22 may serve as an objective standard against which to measure the likelihood of renal damage to the TNS workers.

Despite Reg. Guide 8.22's unofficial status, the NRC and NIOSH relied on it as a valid yardstick. Its authority as a reliable scientific guide is all the more enhanced by its reissuance for comment in January 1987, shortly after publication of NUREG 0874, which provided new technical data on which the 8.22 standards were based. Further, as NIOSH explained in its study of the TNS work force, although 8.22 is couched in terms of exposure to yellowcake, it is equally relevant to exposure to uranium oxide since chemical properties, not the isotopic characteristics of DU, determine renal damage. Accordingly, although no Federal regulations governed nephrotoxic limits for workers exposed to DU prior to the work stoppage, Reg. Guide 8.22 was and is a sound instrument for assessing the potential for damage to the kidneys of the TNS strikers from exposure to toxic substances.

Measuring the employees' uranium-in-urine records against the 8.22 standard, Dr. Nelson's tables demonstrated that there was widespread overexposure among the TNS workers. His charts disclose that of the 100 employees on strike, 53 exceeded one or both of the NRC and Company ceilings. Thirty of these workers had 4 or more consecutive readings over 30 ug/l or more. Data from samplings collected on a bimonthly basis showed that several workers were overexposed for 14 consecutive weeks. Twenty-eight of these exposures were over the 130 ug/l one-time ceiling.

Overexposures were common during the entire quarter preceding the strike. Among employees not required to wear respirators on a full-time basis, 14 employees sustained an average exposure in excess of 30 ug/l for the period between January and April 1981. Among the 17 employees in the penetrator shop, 12 had at least 2 consecutive excessive uranium concentrations, despite the fact that respirators were required at 5 stations there. Thus, as Dr. Nelson concluded, Respondent's contention ''that the respirators were protecting the workers was entirely without foundation.'' (G.C. Exh. 9 at 117.)

Regarding itself free of a legal duty to adopt the 8.22 limits, Respondent chose more relaxed standards which it told NIOSH and TDRH were derived from the DARCOM manual. However, NIOSH stated flatly that the manual offered no justification for such action and notice levels adopted by Respondent. Even using the Company's more lenient guidelines, the data shows that urine samples of 26 employees who worked throughout 1980 contained a uranium content above 100 ug/l. In the first quarter of 1981 alone, 16 employees exceeded the Company's action level on at least one occasion. In the same timespan, 46 employees had a total of 133 urinalysis results over the TNS 50 ug/l notice level. Unfortunately, the Respondent appeared to take little note of these figures. When it did, it resorted to compulsory respirator wear.

On examining the urinalysis data for a 5 year period between 1978 and 1981, NIOSH concluded that uranium exposures at TNS were excessive and gave rise to ''some possibility of renal damage.'' (G.C. Exh. 30 at 19.) Further exposure at the levels witnessed thus far would, in the judgment of NIOSH, produce ''measurable changes in the renal function or development of chemical, renal disease.'' (Id.) NIOSH's prediction of possible renal harm followed logically from its findings of renal damage among Cotter Mill employees with a median urine in uranium level 25 percent less than the median for TNS workers.

NIOSH felt that further study of this matter was contraindicated because the TNS workers did not have lengthy careers with TNS and, therefore, were not likely to reveal measurable changes in renal functions at that time. If the TNS workers escape harm, it will be due in no small part to their refusal to continue working in a plant where the risk of kidney impairment was excessive.

Dr. Morrow's expert opinion regarding the prospect of renal risk to the TNS employees paralleled that of NIOSH and Dr. Nelson. He stated unequivocally that ''all of the biological data on man and laboratory animals would support the employees' contention of excessive uranium exposures and possible renal injury among workers.'' (G.C. Exh. 9 at 119.) While some of the passages in Dr. Morrow's report are cryptic, nothing is ambiguous about his conclusion that: ''Exposure conditions in the TNS plant have been excessive for at least 2 years. Monitoring of the environment and the workers' urine, although inadequate, clearly attests to this fact.'' (Id.)

[184] O'Brien, acknowledged to the Gore Committee that he observed a penetrator shop operator without his respirator, and merely brought the matter to a supervisor's attention.

Dr. Eagilman also considered the TNS urinalysis data in light of the NIOSH Cotter Mill study. Noting that the Cotter Mill employees' uranium doses were far lower than those at TNS, he concluded, to a reasonable degree of medical certainty, that the TNS employees would suffer renal tubular damage which could adversely affect kidney functions and lead to renal failure if they continued to be exposed at the same levels which obtained during the time period covered by the NIOSH study.

Respondent argues that there is no medical showing of biologic damage to the striking TNS employees. This argument blurs the issue in two respects. First, as Dr. Eagilman explained, the sensitive tests which detect the early stages of renal damage were not given to any employee in this case. Thus, nothing could be discerned which would be dispositive one way or the other.[185] Second, Section 502 does not require proof of actual injury. When dangerous accumulations of contaminated uranium dust iumpact on them, employees need not wait until harm is patent before taking preventive action. The very purpose of Section 502 is to guarantee that employees may withhold their labor before actual damage befalls them. Simply because no biologic injury was manifest here, it does not follow that no such injury had occurred or that the threat of injury was not real and present. In reliance on the expert judgments of NIOSH, Doctors Nelson, Morrow, and Eagilman, I conclude that the production processes at TNS generated excessive amounts of uranium dust which subjected the TNS employees to grave and abnormal risks of kidney damage had they continued to labor under the working conditions which existed prior to the strike.

5. Excessive whole body and in vivo exposures

In its TNS study, NIOSH also reviewed data of the employees' whole body exposures and in vivo lung scans.[186] On the basis of Respondent's medical records, NIOSH drew inferences and judgments which contribute significantly to my conclusion that the TNS employees were subjected to abnormally dangerous conditions.

Noting that the TNS employees' whole body radiation doses did not exceed regulatory limits, NIOSH nevertheless pointed out that administrative ceilings are not the only standards to be observed. Under the ALARA concept, feasible levels can be inferred from two other sources: the performance of related industries and the DARCOM manual's proposal that radiation doses from DU should be less than 10 percent of legal limits. Applying these alternative standards to the TNS data, NIOSH found that the doses received by TNS employees were remarkably higher than those of workers in other parts of the the nuclear industry. Workers in the uranium fuel cycle averaged .24 rems, with over 90 percent of such workers receiving doses less than .5 rems annually. Accordingly, NIOSH was surprised to find that the whole body doses of TNS employees between 1975 and 1980 averaged 10 percent higher than those of fellow workers in the nuclear industry. Thus, TNS employees with an average whole body dose in 1980 of 2.43 rems had an abnormally high risk of cancer when compared to the national average for workers in all other nuclear facilities. Moreover, since risk is believed to depend in part on the number of years of life following dose, the younger the worker, the greater the risk. Accordingly, the ante was increased for the youthful TNS work force. Similarly, Dr. Nelson's tabulations showed that 47 of the employees who worked at TNS in 1980 had average whole body doses, 10 times the industry average. An additional seven employees who worked less than a full year in 1980 received doses for that period above the industry average. In this regard, it is important to recall that ICRP 26 selected .5 rems as the average exposure for workers, consistent with risks borne by other employees in safe industries. The 5 rem ceiling was intended to serve only as an outside limit which few workers would attain. It follows that with an average whole body dose of 2.43 in 1980 (10 times the .24 national average for nuclear workers noted by NIOSH), TNS employees were coming perilously close to a recommended exposure ceiling that few workers in the world ever approached.[187]

NIOSH also found that the TNS data from in-vivo monitoring reflected an inadequate margin of safety. Although the TNS employees did not surpass the regulatory ceiling, they did receive yearly doses to the lung of 5.3 to 15.9 rems. ALARA calls for a ''considerably lower body burden.''[188]

NIOSH concluded that the lung burden data was consistent with the urine bioassays results in reflecting substantial dust exposure. Since DU is only mildly radioactive, the amount of contaminated airborne and surface dust needed to reach the levels of exposure recorded at TNS had to be extraordinary. On the basis of its findings, NIOSH proposed to conduct a study of current and former TNS workers to determine whether chromosomal damage had occurred. A mere proposal to conduct a study provides no evidence that chromosomal damage has in fact occurred, but it does suggest that NIOSH had some reason to suspect that the risks were sufficient to warrant such an inquiry.[189]

Although NIOSH did not find conclusive evidence that the TNS employees suffered actual injury, it is worthwhile repeating that such evidence is not necessary in order to find the presence of abnormally dangerous conditions. In conjunction with other evidence of abnormal hazards at TNS, it is enough that NIOSH, an expert, neutral Federal agency, found that the employees were subjected to whole body radiation exposure greater than that experienced by 90 percent of their peers in the nuclear industry. Accordingly, the NIOSH study provides another objective basis for the employees' reason-

[185] A blood test administered to Ricky Decker revealed evidence of heavy metal poisoning which could be caused by exposure to DU, lead and the like. Respondent's attempt to attribute Decker's condition to his infrequent exposure to lead stemming from casual auto repair work rather than exposure to DU during a 40-hour workweek was unpersuasive.

[186] The Institute's findings were described supra in Part Two, C,2.

[187] I also bear in mind Dr. Eagilman's testimony that his review of the international scientific literature indicated to him that the TNS employee exposures were the worst of any reported.

[188] NIOSH declined to comment on health hazards based on the TNS employees' in-vivo exposures without first studying particle size or solubility characteristics of DU, since these factors determine DU's clearance rate and metabolic pathways through the body. Respondent's failure to perform these studies meant that the in-vivo test results could not be relied on with confidence as an accurate gauge of the employees' exposures.

[189] The record contains no evidence that such a study was performed.

able belief that they were subjected to abnormally dangerous conditions.

C. *Respondent's Inadequate Health and Safety Program*

1. Introduction

Paragraphs 7(a) and (b) of the amended complaint allege, in essence, that Respondent's inadequate health and safety programs, in conjunction with the employees' exposure to unprecedented levels of uranium dust produced abnormally dangerous working conditions. I find merit in this aspect of the complaint. In the following sections of this Decision, I discuss the chief factors which compel the conclusion that Respondent contributed to abnormal hazards at TNS by failing to operate its plant in a manner which would avoid injury to its work force.

Under the Federal and state regulatory scheme, an employer bears primary responsibility for enforcing health standards in its facility. The employer must limit contamination, must construct and install processing and engineering controls on equipment. It must monitor the workplace and the work force and take steps to ameliorate conditions when survey results give notice that such action is required. Under the best of circumstances, biannual inspections by TDRH were hardly sufficient to guarantee day-by-day compliance with its dictates. Indeed, compliance may not either be assumed or presumed from the fact that such inspections occurred.

The duty of an employer such as TNS to scrupulously obey applicable health codes is particularly critical where the hazard is invisible, silent and latent. When a hazard cannot be detected by the human senses, employees are particularly vulnerable and must trust their employer not to expose them to abnormal danger. The untutored work force at TNS was ill-equipped to translate monitoring results derived by the sensitive devices used to measure exposure to alpha particles or the chemically toxic agents emitted by DU. Possessing the requisite knowledge and training to detect the dangers that existed, Respondent was duty bound to mitigate the risk of harm to its employees, consistent with the ALARA concept. The record provides abundant evidence that Respondent failed to take necessary, reasonable and practical precautions to reduce the immediate dangers to its work force. Respondent resorted to stopgap measures to contain contamination. When such measures failed, it clapped respirators on the employees instead of instituting fundamental technological modifications well within its reach. It failed to employ an adequate number of health and safety personnel empowered to command strict compliance with prescribed health practices; instead, it vested responsibility for training and adherence to health standards in poorly trained foremen. Evincing a lack of concern for its employees' health and safety, Respondent persuaded a course of conduct which exacerbated rather than abated dangers in the workplace. Its own deportment in part provided a basis for the workers' reasonable beliefs and actions with respect to abnormally dangerous conditions at TNS.

2. Equipment failures and feasibility of corrective action

The General Counsel presented considerable evidence of the improvements which Respondent introduced at TNS subsequent to the work stoppage, thereby proving the ''feasibility of precautionary measures'' which ''if taken previously, would have made the event less likely to occur'' *Federal Rule of Evidence* 407.[190]

Respondent did not contend that the many alterations in design, engineering processes and operational procedures which were implemented subsequent to the strike were unknown and could not have been accomplished at an earlier time. Rather, Respondent posited that management instituted improvements as a deliberate, step-by-step response to a perceived need, somewhat on a trial and error basis. Respondent introduced a number of documents to prove that management consistently made improvements at TNS before the work stoppage began. However, the actions taken were too little and too late and apparently did not abate the problem since contamination levels and employee bioassay results continued at unacceptable levels. Several memos indicate that management responded to recognized dust problems at the plant by referring the matter to further study. (See, e.g., R. Exh. 503.) A lengthy management proposal outlined recommended health physics improvements in the mold and derby breakout area, but there is no evidence that any of the suggestions was implemented. Indeed, Honeycutt, the author of this proposal, wrote in February 1981 that ''stop gap emergency measures have been initiated but engineering of the final plan has not been done.'' (R. Exh. 517.) Plant engineer Romaine stated that in late spring 1981, he designed and installed ''demisters'' as adjuncts to the Torit mist collectors in the penetrator shop, and claimed that these devices successfully removed uranium swarf from the coolant spraying over the grinders. However, no evidence was introduced that the new devices cured the air quality problems in the penetrator shop since TNS employees were required to wear respirators until the day before the strike began. Apparently, Davis was not impressed with the demisters for he declared that the ventilation system was poorly designed. Overall, Respondent's prestrike corrective actions were ineffective and did not bring about meaningful change.

Respondent knew in advance of the strike that its operations were substandard, as O'Brien acknowledged to the Gore Committee. Management was aware that the cracked and grooved cement floor trapped greensalt and contaminated dirt, that the blender leaked greensalt, that ventilation depended in part on the opening and closing of doors to the shop, that the 1200 pound derbies billowed clouds of contaminated smoke when dumped on the floor and that frequent blowouts unleached thousands of pounds of contaminants to the foundry's atmosphere. A 1-day tour of the facility was enough to reveal to the RMC consultant that the ventilation system leaked and was poorly designed, that the horseshoe ventilation collars leaked and the downdraft tables were defective, that coolant mist which sprayed on the grinding parts was not captured adequately by the penetrator shop demisters and also sprayed on the employees. Respondent also had reason to know that when operators cleaned mold sleeves and crucibles, they exposed their unprotected faces as they bent over the oxide-ridden containers; that penetrator shop opera-

[190] Respondent is not charged here with the tort of negligence. Therefore, Federal Rule 407, which bars evidence that hazardous conditions were improved or corrected as proof of culpable conduct, is inapplicable here.

tors stuffed wet paper towels into their grinders to reduce the dust from the oxide particles and chips which were ejected, and that DU's pyroforic qualities made fires inevitable at the unventilated lathe and saw.

Respondent's performance at its California facility proved that it could run a plant in accordance with sound engineering principles when it chose to do so. Grinders functioned at the Compton plant without contaminated mists spraying on the operators. Workers there did not wear respirators, did not stand on rubber floormats to prevent slippage on a coolant-slick floor and did not need to shower at the end of the day. Compton may have been a more desirable working environment in part because each grinder had its own mist collector whereas at TNS, one mist collector serviced two. Moreover, any malfunction of the ventilatory equipment at Compton was quickly detected and corrected for health physics personnel tested the devices daily.

The RMC report sounded a note of alarm when it warned Respondent that ''there is an immediate need to correct the high airborne problem by engineering means.'' Regrettably, Respondent did not heed its consultant's advice although the principle of encasing equipment to insulate employees from excessive exposure to contaminants was a basic strategm used by health physics experts since at least World War II.[191] Not until the spring of 1982 did Respondent began to modify its operating equipment significantly. At that late date, a year after the strike began, Respondent enclosed and ventilated the blender and enlarged vacuum furnaces as the Union had proposed a year earlier. Similarly, Respondent constructed a ventilated tunnel which encased the route from the reduction furnaces to the breakout area, and installed booths at which workers slagged derbies through portholes using hand-powered tools. Cylinders and mold assemblies were scoured with automated equipment rather than by hand and dust collectors were modified to operate at negative pressure so that any air leakage would not expel contaminated dust into the shop. Not one of the corrective measure which Respondent began to take in 1982 involved innovative technology. That Respondent waited until the spring of 1982 to redesign its plant suggests that the strike was largely responsible for these changes, although the striking employees were not permitted to reap their benefits.

3. Health and safety staff deficiencies

The laxity evident in Respondent's failure to streamline the production processes is paralleled by its inattention to the quality of the health physics staff. Prior to December 1979, when Barlow became the first RSO, TDRH regarded the person in charge of the health physics program at TNS as incompetent. Although an improvement over his predecessor, Barlow had only minimal health physics training. Despite the addition of Sally Hock, the staff still was too short-handed to serve the night shift. Further, they had neither authority nor autonomy, and could not command approval for proposed reforms. Thus, Barlow admitted to an employee that his hands were tied by his supervisor, Hoynacki. Hoynacki, in turn, was unable to convince his superiors to shut down operations when a number of employees revealed excessive urinalysis results.

Barlow increased the number of respirators available to employees and offered group training in 1980. However, he did not comply with the strictures of Reg Guide 8.15 even after TNS promised TDRH that it would do so. Indeed, he kept at least one employee's respirator at home. However well-intentioned Barlow may have been, he did not have the resources to do his job properly. His small staff could not keep up properly to calibrate testing devices, thereby putting test results in question. He was lax with monitoring records, keeping some of them at home and failing to put them into comprehensive form until sometime in 1981. He was unable to assure TDRH that the fixed air samplers were stationed at appropriate heights so that they accurately measured air in the worker's immediate breathing zone. The health and safety staff did not patrol the shop floor routinely to monitor air quality after blowouts or test the suction on the torit mist collectors as did their counterparts in California. They were unable to convince management prior to the strike, as they were afterwared, to purchase needed personal BZ samplers.

By default, first-level foreman bore the brunt of implementing Respondent's health phsyics program, but most of them, promoted from the rank and file, had no more training in health safety than did their crews. They had minimal understanding of and merely read them the instructional materials with little comprehension to the workers assembled at weekly gatherings. One foreman was so nonplussed by his assignment that he played cards with his workers in lieu of conducting the weekly training session. Given their competing duty to meet production goals, it is no surprise that the foremen gave little more than lip service to health physics principles. They failed to demand strict compliance with health and safety rules, particularly when it meant that a worker took longer to perform his job. One supervisor went so far as to alter a TLD badge to prevent an employee's transfer to a less exposed post.

Other supervisors, while not so devious, just careless or indifferent. For example, although Respondent's training materials instructed that greensalt spills were to be cordoned off and immediately cleaned up, foremen directed employees to put off this task until the end of the shift. Officially, employees were not supposed to sit on derbies and were to wear gloves when handling uranium. However, supervisors simply ignored the employee's failure to comply. Foreman had authority to order employees to evacuate the plant during blowouts, but seldom used it. They also were supposed to allow employees to leave the shop floor whenever they required relief from prolonged respirator use. Instead, they limited fresh air breaks to one employee at a time.

During the poststrike period Respondent not only made safety-related changes to its physical plant, it also upgraded its health physics staff. The number of health and safety personnel were doubled after the strike although the work force were smaller, and an RSO was employed who had graduate training and considerable experience in health physics. With this expansion, all three shifts were covered. Under new licensing commitments, the RSO had and asserted the authority to shut down an operation when air contamination exceeded 50 percent of MPC.

Respondent also began giving thorough pre-employment physical exams and a more comprehensive health and safety orientation to the replacement employees. Supervisors, too, were given special training in health and safety matters as

[191] See An Introduction to Radiation Protection, supra.

the NRC regulations always required. The health physics staff became particularly vigilant in caring for respirators. Although no longer used excessively in the post-strike era, respirators were treated with the hygienic rigor reserved for a hospital operating room.

4. Lack of management commitment

The record provides ample evidence that a cure for unhealthy working conditions at TNS lay within Respondent's technological grasp. The record is equally clear that the Respondent failed to take available means to control contamination and prevent excessive exposure of the work force. The Company's disregard for sound health physics practices was aptly described by its own consultant who wrote: ''There seems to be a lack of management commitment to a radiation safety program.'' (G.C. Exh. 10 at 4.) Dr. Morrow was even less generous in his appraisal, calling operating practices at TNS, ''atrocious.'' (G.C. Exh. 9 at 118.)

These assessments echoed those of TDRH which repeatedly admonished Respondent that its radiation safety program was not ''administered adequately to provide the maximum degree of protection for your employees . . . .'' (See, e.g., G.C. Exh. 60b, G.C. Exh. 60p.) More forceful comments appeared in the TDRH internal inspection reports of September and December 1981 with an inspector writing that Respondent's radiation program was not being conducted in a manner adequate to insure that individuals were protected from excessive levels of radiation. A January 1982 letter closed with the following criticism: ''. . . it appears that your safety program was inadequate to protect workers from unnecessary radiation. It is imperative that TNS, Inc., immediately secure the expertise and resources necessary to implement an adequate safety program.'' (G.C. Exh. 60rr.)

TDRH did not say in so many words that TNS was an abnormally dangerous facility; that was not a term of art in the Department's lexicon. But its endless correspondence with Respondent reveals the dimensions of its persistent concern with the TNS health and safety program. That correspondence also reveals a regrettable incapacity to effectuate reforms prior to the strike. When the strike was all but over TDRH expressed its serious reservations about health conditions at TNS more pointedly. In a January 28, 1982, letter, TDRH wrote: ''No documentation was provided which would indicate that TNS had a health physics program that would effectively control worker exposure to airborne uranium dust. The department has specific concerns regarding appropriate supervision of respirator use, process containment of dust, surface contamination control, monitoring techniques, etc.'' (G.C. Exh. 60rr.)

Even if TDRH had been apprised of all of TNS' health and safety deficiencies, it is doubtful that it would have attempted to shut down Respondent's operations. Such a sanction was virtually unthinkable to the Agency's functionaries. The State's Attorney General advised TDRH it had no authority to impound material or equipment. State's attornies made it abundantly clear to Inspector West that license revocation through judicial process was ''very, very difficult.'' Thus, although TDRH had theoretical authority to seek a license revocation, it was a power never invoked. The TNS employees had good reason to resort to self help when the Agency charged with protecting them, lacked the power or will to do so.[192]

Respondent points out that Dr. Auxier and Davis testified that the TNS health and safety program was average and adequate.[193] Of course, since they had no occasion to see any facet of the program in operation, they must have been commenting only on Respondent's written materials (some of which Davis did not see). Undeniably, Respondent had written training materials prescribing safe operational and health and safety procedures; it also had a written respiratory program which tracked the language of the NRC guidelines. All that Respondent lacked was the will to follow through in practice what it committed to paper.

In its posttrial brief, Respondent selectively extracts out of context, a few statements from TDRH documents of March and May 1981 and disingenuously argues that the State agency did not conclude that abnormal dangers prevailed at TNS. Neither Respondent's technique nor its conclusion is justified.

Inspector West's comment in a March 4, 1981 report that there was ''no apparent crisis or imminent danger at TNS'' (G.C. Exh. 60v at 3) was unjustified considering the limited scope of his visit and the more limited records which he reviewed on that occasion. Several months later, when he answered the OCAW complaint by writing that ''urinalysis levels appeared to be below those at which hazards . . . have been shown to exist'' (G.C. Exh. 60(v)), he admittedly was parroting the Company's position. His uncritical acceptance of the Respondent's urinalysis standards is puzzling since TDRH previously had requested Respondent to furnish its rationale for adopting the lenient DARCOM action and notice levels. The record fails to reveal that TNS ever submitted the requested justification. Further, West's total lack of knowledge about DU's chemical properties may not be ignored. He conceded that he did not think the Department's authority covered chemically toxic hazards. Thus, TDRH did not seriously or independently consider the possibility of renal injury to the TNS workers.

TDRH failed to disclose to OCAW either that its investigation of its complaint was stymied because Respondent withheld relevant information or that it had yielded to the Company's urinalysis standards. Even when TDRH gathered more complete information, it failed to inform the Union. In light of these limitations, the TDRH reply to OCAW's urgent

[192] After the Gore Committee hearing, the Tennessee General Assembly amended the Radiologic Health Service Act, granting the Department authority to impose civil and criminal fines and/or imprisonment for each day that regulations continued to be violated.

[193] Respondent also noted that the Tennessee Occupational Safety and Health Agency (TOSHA) gave TNS a semiclean bill of health pursuant to an inspection of June 9, 1981. However, since Tennessee is an agreement state with OSHA, TOSHA is precluded by statute from assuming the NRC's jurisdiction. Thus, TOSHA did not regularly monitor the TNS working environment to determine levels of airborne contamination. More significantly, the TOSHA inspector monitored air quality in various parts of the plant for only a single 8-hour period, not for entire calendar quarters as did TDRH. Commenting on this, Dr. Morrow commented, the TOSHA measurement ''is indicative of ignorance'' and not ''operationally suitable to measure MPC for uranium in air'' (G.C. Exh. 9 at 119.)

telegram was unresponsive and inadvertently misleading.[194] It certainly provides no basis for Respondent's unwarranted assertion that TDRH bestowed on it a clean bill of health.

Respondent goes further. After incorrectly asserting that TDRH concluded that no abnormal dangers existed at TNS, Respondent argues that the NLRB is obliged to defer to that nonexistent conclusion. Even if TDRH had reached such a verdict it would not be conclusive. The NLRB is not obliged to defer to opinions formed by administrators who operate under a statute with a purpose distinct from that of the LMRA, although it may consider another agency's factual findings. Regardless of the manner in which another administrative agency treated the Union's complaint, Congress has granted to the NLRB ultimate authority under the Act to determine whether the Respondent may permanently replace TNS employees who struck in good faith over abnormally dangerous working conditions and whether Respondent acted lawfully thereafter. The exercise of this authority is not preempted by nor inconsistent with the role of other agencies which regulate substantive health and safety conditions in the work place, but it is plenary.

The terms of Section 10(a) of the Labor Act further strengthen the conclusion that the Board's authority over Section 502 work stoppages is unaffected by Federal or state statutes regulating health and safety in the workplace. The section states that the Board's power to deal with unfair labor practices ''shall not be affected by any other means of adjustment or prevention that has been or may be established by agreement, law, or otherwise . . . .''

Further, no conflict need exist between two concurrent schemes of regulatory authority over allegations of abnormally dangerous conditions. Indeed, concurrent authority is necessary to fulfill the ojectives of each statute. The purpose of the Tennessee Radiologic Health Service Act was to apply ''controls and regulations to radiological safety to protect the health and well being of people in Tennessee'' (9 B Tenn. Code Ann. 53-3303, 1959), but neither the Tennessee statute nor its regulations gave employees the right to walk off the job.

In contrast, one of the primary purposes of the LRMA is to accord employees the right to engage in concerted activity for their mutual aid and protection. To protect this basic Section 7 right from infringement, the Board is empowered to award remedies such as reinstatement and backpay. TDRH had no such remedies available to it. Given these fundamental differences between the two acts, the Board may not ''abandon an independent inquiry into the requirements of its own statute and mechanically accept standards elaborated by another agency under a different statute for wholly different purposes.'' *Carpenters Local 1976 (Sand Door) v. NLRB*, 357 U.S. 93, 111 (1957).[195] As the Board stated in *Tamara Foods*, supra at 1309:

> the rights guaranteed to employees under the National Labor Relations Act are distinct from and are not subordinate to the provisions of the Occupational Safety and Health Act. . . . To hold otherwise might seriously diminish the rights of employees to engage in concerted activity for their mutual aid and protection and would constitute an abdication of the role that Congress has assigned to the National Labor Relations Act in protecting these rights.[196]

The Board's position in *Tamara Foods* is equally applicable in the present case. While the Board must carefully accommodate its statutory scheme with others, the Board may not defer to another agency which is not charged, as is the Board, with protecting employees who strike in good faith over abnormally dangerous conditions.

There is no reason to assume, nor is it necessary to prove, that Respondent's officials intended to subject its employees to unacceptable risks. Putting the question of motivation aside, the record in this case reveals that by failing to diligently exercise the degree of care owed to its employees, Respondent allowed a hazardous workplace to degenerate into one which was abnormally dangerous. Respondent's laxity in complying with regulatory health protection standards may not, in itself, constitute an abnormally dangerous working condition, although under certain circumstances, human failings may pose as great a threat to health and safety as mechanical ones. Here, where the TNS employees were beset by uranium contaminants, it was not too much to expect that their employer would take every reasonable precaution to prevent harm beyond that which was endemic to the job. In most cases, the natural inclination is to reduce to the extent feasible those harms which are avoidable. As the Respondent demonstrated after the strike, it could and should have cured aberrant conditions at the plant through commonly known managerial reforms and technological modifications long before a work stoppage became necessary.[197] Instead, Respondent failed to overhaul its malfunctioning machinery, preferring instead to saddle its employees with burdensome respiratory equipment, failed to gird its supervisory staff with sufficient authority to insist on adherence to sound health practices and withheld information from employees and TDRH regarding excessive exposures. By opting for stop-gap measures, and by refusing to give serious attention to the employees' frequently voiced concerns about excessive hazards in their workplace, Respondent revealed a greater regard for productivity than for human well-being.[198] When the employees, whose lives were on the line, reasonably viewed

[194] After reviewing the correspondence and the relationship between TDRH and TNS, then Congressman Gore concluded ''that the system really is not working . . . .'' (G.C. Exh. 9 at 307.)

[195] The Supreme Court distinguished *Sand Door* from *Southern Steamship*, supra, where it disapproved of a Board remedy found to weaken another statutory purpose (punishment of mutiny). In the instant case, a finding that the working conditions at TNS were abnormally dangerous not only is consistent with but reinforces the essential work of TDRH.

[196] See also *Service Machine & Shipbuilding Corp.*, 253 NLRB 628 fn. 1 (1980) (OSHA determination not factually or legally binding); *United Stove Co.*, 245 NLRB 1402, 1407 fn. 7 (1979) (TOSHA's failure to issue citation ''does not constitute a litigated finding'' as to issues in Board case).

[197] See, e.g., *Richmond Tank*, supra at 176 and *Daniels Construction Co.*, supra, which suggested that an employer has a duty to correct unsafe conditions whenever possible.

[198] Following a colloquy with Respondent's Vice President Schell, who insisted throughout the Congressional hearing that the struggle was over the Union's attempt to usurp management's rights, Congressman Gore concluded that TNS ''viewed the employees in the nature of another raw material in the production process and so long as you could get by with lax inspections not holding you accountable, you were willing to do so.'' (G.C. Exh. 9 at 108.)

their working conditions as so intolerable that they were compelled to strike, they were entitled to the protections of Section 502 .

Conclusion

In sum, based on the entire record, I conclude that the General Counsel has established by a preponderance of the evidence that the TNS employees engaged in a work stoppage from May 1, 1981, to February 15, 1982, because of their reasonable, good-faith belief, supported by competent evidence, that their working conditions were abnormally dangerous within the meaning of Section 502 of the Act, by virtue of their long-term exposure to unprecedented levels of disputed uranium dust compounded by Respondent's inadequate health and safety programs.

D. *Section 502 Applies to the TNS Strike*

1. Background

During the preliminary stages of this case, Respondent moved to dismiss the complaint on grounds that it failed to state a claim on which relief could be granted. In substance, Respondent argued that the legislative history accompanying the enactment of Section 502 and cases which have construed that provision, prove conclusively that Section 502 operates solely to create a limited defense for employees who engage in work stoppages over abnormally dangerous conditions while a contractual or statutory no-strike ban is in effect. Where, as here, no such ban existed, Respondent insists that Section 502 may not be invoked to protect strikers such as those at TNS.

Respondent concedes that the TNS strikers were engaged in protected concerted activity. However, Respondent contends that even if the workers were protesting abnormally dangerous conditions, they were not reacting to conduct which is proscribed as an unfair labor practice. Therefore, Respondent properly treated them as economic strikers, lawfully hired permanent replacements, and on the strikers' unconditional offer to return to work, placed their names on a preferential hiring list subject to reinstatement as suitable vacancies arose.

In opposing the successive motions to dismiss, the General Counsel and Charging Party alleged that neither precedent nor the legislative history of the Labor Management Reporting Act (LMRA) supports Respondent's restrictive interpretation[199] of Section 502. Rather, they contend that fairly construed, Section 502 protects strikers such as those at TNS from permanent replacement even after the expiration of their collective-bargaining agreement. The General Counsel and Charging Party submit that Section 502 strikers warrant no less protection than that accorded to unfair labor practice strikers; that is, on an unconditional offer to return to work, such strikers are entitled to immediate reinstatement and backpay. In short, what is at stake in this case is whether the employees are to be treated as if they were economic strikers as the Respondent contends, or by analogy, regarded as unfair labor practice strikers as the General Counsel and Charging Party allege.

By order of August 11, 1983, Judge Schlesinger denied the motion to dismiss, ruling that in the absence of legislative history, Section 502 was not necessarily limited to the narrow purpose suggested by the Respondent. Instead, the administrative law judge decided that the General Counsel and Charging Party's arguments that Section 502 also exempts employees from the definition of strikers if their work stoppage is over abnormally dangerous conditions, was ''not without merit.''

Following my appointment to this case, Respondent resubmitted its motion to dismiss. By Order dated November 7, 1983, I ruled that the August 11 Order was law of the case. At the conclusion of the General Counsel's case-in-chief, Respondent orally renewed its motion to dismiss, relying for the most part, on the same reasoning contained in its original pleadings. In addition, the Respondent cited certain recent cases which it believed represented the Board's current thinking on Section 502.[200] I denied Respondent's motion, concluding that the law of the case doctrine continued to prevail, thereby making the August 11 Order controlling. However, I indicated, parenthetically, that if I were to rule independently on this matter, neither the legislative history of the Taft-Hartley Amendments nor the case law would compel the conclusion that Respondent's motion to dismiss the amended complaint should be granted.

After the hearing concluded, Respondent filed another special appeal with the Board renewing its motion to dismiss the amended complaint. By telegraphic order of February 22, 1985, the Board denied the motion without prejudice to renew its contentions by way of exceptions.

In light of the Board's Order, and on the basis of a fully developed record, it is now appropriate that I articulate the considerations which impel me to conclude that Respondent's motion should be denied.

2. Section 502 and LMRA legislative history

Respondent contends that a sound analysis of the legislative history attending the enactment of Section 502 establishes that the sole purpose of that clause was to exempt a work stoppage caused by abnormally dangerous conditions from statutory or contractual strike prohibitions.[201]

Briefly stated, Respondent's argument is as follows. Section 13 of the original NLRA imposed no limitations on the right to strike, providing only that: ''Nothing in this Act, except as specifically provided for herein, shall be construed so as either to interfere with, or impede or diminish in any way the right to strike.'' Notwithstanding this broad guarantee, in the years following the Act's passage, the Board and the courts declared various types of strikes to be unlawful.[202]

[199] The LMRA is sometimes referred to as the Taft-Hartley Act, so named after the legislators who were instrumental in introducing the bills in the U.S. Senate and House of Representatives, respectively.

[200] These cases will be discussed further below.

[201] The Board observed in *Knight Morley Corp.*, supra at 146, that there is no legislative history which sheds light on Sec. 502. Almost 2 decades later, the Supreme Court reached the same conclusion in *NLRB v. Gateway Coal Co.*, supra at 636 fn. 8. Therefore, when Respondent refers to the legislative history of Sec. 502 , it actually is referring to the legislative history attending other Taft-Hartley amendments, in particular the amendment of Sec. 13.

[202] See, e.g., *NLRB v. Sands Mfg. Co.*, 306 U.S. 332 (1939) (strike in violation of a no-strike clause in a collective-bargaining agree-

Continued

Then, in 1947, Congress proposed numerous amendments to the Act to curb the perceived excesses of unions. House Rule 3020, as originally passed in the House of Representatives, contained a new Section 12 which enumerated various types of unlawful union activities. A final section (12(e)) contained the language which previously appeared in Section 13 of the NLRA together with the following underlined sentence:

> Except as specifically provided in this Section, nothing in this Act shall be construed to diminish the right of employees to strike or to engage in other lawful concerted activities. *No provision of this Act and no order of any court issued hereunder, shall be construed to require any individual to perform labor or service without his consent.* [Emphasis added.] H.R. 3020, 12(e), I Legislative History of the Labor Management Relations Act, 1947 [hereinafter 1947 Legislative History at 80, 207].

In conference, the cumbersome Section 12 was deleted. In its place the House accepted as an amendment, a provision from the Senate bill, S. 1126, which simply added the following phrase to the original text of Section 13: ''or to affect the limitations or qualifications on that right.'' The Senate proposal also contained a separate provision designated Section 502 which later was inserted in H.R. 3020 and remained a part of that Bill as it passed through both Houses of Congress. The Respondent claims that the underlined sentence in Section 12(e) as quoted above represents the genesis of a similar clause in Section 502 . Respondent then reasons that because the first sentence of Section 12(e) ultimately appeared in Section 13 and and the second in Section 502 as enacted, the purported nexus between these sections proves that the sole function of Section 502 is to grant protective status to strikers who protest abnormally dangerous conditions in the face of ''limitations and qualifications'' on the right to strike as codified in Section 13. In other words, Respondent submits that Section 502 should be read as if it stated that when employees cease work over abnormally dangerous conditions their work stoppage ''shall not be deemed *a*[n] *unprotected* strike'' unless their collective-bargaining agreement or a statute imposes a no-strike duty (emphasis added). Respondent's interpretation permits it to argue that such a stoppage must be treated as an ordinary economic strike.

Respondent's reading of the legislative history of the LMRA defies logical analysis. Despite the clarity of the statutory language, Respondent argues that it does not say that work stoppages to protest abnormally dangerous conditions shall not be strikes, but only those which occur in violation of a no-strike clause. In this strained effort to prove that a work stoppage under Section 502 is nothing more than a protected strike, Respondent forgets that a cardinal rule of statutory construction requires that ''the starting point for interpreting a statute is the language of the statute itself.'' *Consumer Product Safety Commission v. GTE Sylvania, Inc.*, 447 U.S. 102, 108 (1980), and that ''significance and effect shall, if possible, be accorded to every word'' of the disputed provision. *Market Co. v. Hoffman*, 101 U.S. 112, 115–116.

The operative words of Section 502 do not refer either to a protected or unprotected strike, to an economic strike or an unfair labor practice strike. Rather, in concise and unambiguous terms, Congress declared that a work stoppage over abnormally dangerous conditions shall not be deemed a strike at all. The use of the words ''abnormally dangerous'' (which appear nowhere else in the Act) implicitly announce that the provision addresses a situation so grave as to be beyond the compass of the ordinary strike. Therefore, when Congress said that a work stoppage over abnormally dangerous conditions shall not be deemed a strike, I must assume that Congress meant exactly what it said.

Of course, the words of Section 502 should not be read literally if to do so would obscure or distort congressional intent reflected in other portions of the Act. *Market v. Hoffman*, supra at 115–116. Each section should be construed in a manner which harmonizes with other ''provisions of the whole law and to its object and policy.'' *Mastro Plastics Corp. v. NLRB*, 350 U.S. 270, 285 (1956). To this end, Respondent attempts to read Section 502 as if one of its clauses (and not even the clause at issue here)[203] was an integral part of Section 13, as it previously appeared in the disgarded Section 12(e). By such legerdemain, Respondent tries to obscure the fact that Section 12 was jettisoned in its entirety.

Further, the Senate did not borrow the underlined clause in Section 12(e) on which Respondent constructs its own version of the legislative history. Rather, Section 502 appeared independently and without elaboration in S. 1126 at the time that Bill was introduced, just 1 week after H.R. 3020 was submitted from Committee to the House. I 1947 Legislative History at 407, 436, 453. The original H.R. 3020 did not include the language of Section 502 at issue in this case. Rather, Section 502 was adopted intact from S. 1126 and inserted as an amendment into the House Bill without any clarification. What emerges from this somewhat intricate chronology is that the critical sentence in Section 502 which is at issue here did not appear in and was not ''borrowed'' from H.R. Section 12(e). Moreover, when Section 502 was adopted as an amendment to H.R. 3020, the House Report drew no connection between that section and the abandoned Section 12(e) or the modified Section 13. Proper statutory interpretation does not rely on what the legislature did not do nor on what proposed provisions it chose to reject. Even if such events were part of the overall chronology of this legislation, such material forms no part of the ''legislative history'' used in construing a statute.

Congress clearly had in mind more than a duplicate Section 13 when it enacted Section 502 as an independent and penultimate provision of the entire Act. Its clear purpose is contained in the Senate report accompanying S. 1126: ''Section 502 contains a saving clause making it clear that no provision of the act is to be construed as compelling an employee to render forced labor without his consent or to work

ment); *Fansteel Metallurgical Corp. v. NLRB*, 306 U.S. 240 (1939) (violence or other illegal acts while on strike); *Southern Steamship Co. v. NLRB*, 316 U.S. 31 (1942) (strike violative of another Federal law); *Thompson Products*, 72 NLRB 886 (1947) (unlawful recognition strike); *American News Co.*, 55 NLRB 1302 (1947) (strike to compel employer to violate Federal law).

[203] It is the first phrase in Sec. 502 (''Nothing in this Act shall be construed to require an individual employee to render labor or service without his consent'') which parallels similar language in the proposed text of sec. 12(e).

under abnormally hazardous conditions.'' (emphasis added) I 1947 Legislative History at 436. Fairly construed, this explanation indicates that Section 502 was drafted basically to protect employees from any imposition on the right to cease working when confronted by extra hazardous conditions. If the legislators intended to draw a connection between Sections 502 and 13, it would have done so in this report.[204]

The Conference Report generally explains that the House agreed to delete Section 12 in its entirety concluding that that the itemization of specific unfair labor practices there was unnecessary and might be read as excluding improper conduct not expressly mentioned. I 1947 Legislative History at 543. However, the report does not even suggest a nexus between the excised Section 12(e) and Section 502. I 1947 Legislative History at 563, 573.

If Congress had intended the final clause in Section 502 to apply solely as a defense to the ''limitations or qualifications'' on strikes codified in Section 13, it could have added a single work to the text: ''shall not be deemed a[n] *unprotected* strike. Respondent asserts that the inserted word should be read into Section 502, but to do so without reason ignores the admonition that unless the omission of a word is an obvious error, ''it is is always a dangerous business to fill in the text of the statute . . . .'' 2A C. Sands, *Sutherland, Statutory Construction*, Sec. 47.38 (1984) (4th ed. 1984). Insertion of the word ''unprotected'' into Section 502 imputes a restricted purpose to it which nothing in the legislative history indicates Congress intended.

The General Counsel and Charging Party submit that Section 502 functions not only to protect a work stoppage that might otherwise be prohibited by a no- strike clause, but also to protect employees from the hardship of permanent replacement. I agree.

Counsel posit and the legislative history confirms that Congress was well aware of the distinction between economic and unfair labor practice strikes. During the legislative process attending the enactment of the Taft-Hartley amendments, the treatment of economic strikers as distinct from unfair labor practice strikers received both direct and indirect congressional attention. Thus, the House version of the Bill defined an ''employee'' to include unfair labor practice strikers but excluded from that definition, permanently replaced economic strikers.[205] As explained in the House report, the reason for the change to Section 2(3) was: ''The Board now says that an employer may replace ''an economic'' striker, one who strikes for higher pay or other changes in working conditions. The bill writes this rule into the Act . . . .''[206] By referring to the Board's policy concerning replacement of economic strikers, the Committee clearly was referring to the Supreme Court's decision in *NLRB v. Mackay Radio Co.*, 304 U.S. 333 (1938), although the decision was not cited. In that early landmark case, employees went on strike when negotiations failed to achieve satisfactory terms for a new collective bargaining agreement. The company transferred to its struck office, employees from its offices in other cities, some of whom agreed to the transfer on condition they be allowed to remain. Subsequently, the strike failed and all but five of the strikers were reinstated. The NLRB complaint alleged that the company discrminatorily discharged and refused to reinstate the five because of their union activism. The Supreme Court ultimately held that in spite of the broad protections on the right to strike afforded by Section 13 of the Act,

> it does not follow that an employer guilty of no act denounced by the statute, has lost the right to protect and continue his business by supplying places left vacant by strikers. And the employer is not bound to discharge those hired to fill the places of strikers, on the election of the latter to resume their employment, in order to create places for them.

Id. at 345–346.

The limited rights of economic strikers received additional attention during consideration of amendments to Section 9 of the Act. Taft-Hartley proposed a new section, 9(c)(3), which provided, inter alia, that ''employees on strike who are not entitled to reinstatement shall not be eligible to vote.'' I 1947 Legislative History at 10. In justifying this section, the Senate Committee on Education and Labor relied on Mackay expressly noting that: ''If such strike is an economic one . . . strikers permanently replaced have no right to reinstatement (*NLRB v. Mackay Radio* . . . .'') I 1947 Legislative History, at 431.[207]

These excerpts from the legislative history unquestionably prove that Congress was keenly aware of the *Mackay* rule which permitted employers who were guilty of no unfair labor practice to hire permanent replacements with no duty to reinstate strikers even if vacancies subsequently arose. Thus, from the Act's earliest days, the Board and the courts consistently held that a replaced economic striker had no right to his former job unless he could show actual discrimi-

[204] The same report did discuss related sections where it was appropriate. For example, the report states that Sec. 301 should be read in connection with the provisions of Sec. 8 of Title One, and adds that the legal effect of this section has been described at some length in the main body of the report, supra.'' I 1947 Legislative History at 436. Thus, the authors of the Taft-Hartley amendments were perfectly capable of describing relationships between various sections of the bill and did so when such relationships existed.

[205] Specifically, the Bill provided that the term ''employee'' would include: ''any individual whose work has ceased as a consequence of a current labor dispute (unless such individual has been replaced by a regular replacement or has obtained regular and substantially equivalent employment . . . .'' I 1947 Legislative History at 161–162. A ''regular replacement'' was defined as an: ''individual who replaces an individual whose work has ceased as a consequence of a labor dispute, if the duration of his employment is not to be determined with reference to the existence or duration of such labor disputes.'' Id. at 162.

[206] I 1947 Legislative History at 3036.

[207] Senate critics (assuming that replacements would be hostile to the union and seek to decertify it) objected strongly to this amendment arguing that if an employer hired enough permanent replacements, both union adherents and the union could be vanquished. I 1947 Legislative History at 472. Such prophecies were translated into reality at TNS when replacement employees filed a decertification petition. However, the petition was stayed pending resolution of the instant unfair labor practice complaint.

Sec. 9(c)(3) was amended in 1959 by the Landrum Griffin Act to permit permanently replaced economic strikers to vote in a representation election conducted within 12 months of the onset of a strike. See H.R. Rep. No. 1147 (Conference Report), 86 Cong. First Sess., 37–38 (1959), reprinted in I Legislative History of the Labor Management Reporting Act of 1959 at 931, 941–942 (1960). Congress took this action because experience with Sec. 9(c)(3) demonstrated that ''it was an unfair, 'union busting' rule.'' Id. at 428.

nation in the filling of vacancies.[208] Not until 1968 in *Laidlaw Corp.*, 171 NLRB 136 (1968),[209] did the Board recognize that replaced economic strikers remained employees under Section 2(3) of the Act and were entitled to reinstatement as suitable vacancies arose. Prior to *Laidlaw*, even if replaced economic strikers were rehired, they retained no seniority or other rights incidental to their original employment. And prior to the Landrum Griffin amendments, Section 9(c)(3), which capitalized on *Mackay*, afforded employers a powerful strike breaking weapon. That today, employees may be entitled to wait for job openings is hardly relevant in determining what Congress perceived emloyee rights to be when enacting Section 502. Thus, it is reasonable to infer, as do the General Counsel and Charging Party, that Congress purposely intended to exempt employees who confronted abnormally dangerous conditions from this body of economic strike law by declaring that a Section 502 dispute was not to be deemed a strike. The Taft-Hartley amendments did not disturb the application of the *Mackay* doctrine to economic strikers. Given Congressional recognition of *Mackay*'s consequences on strikers, it requires no leap of logic to reason that the legislators intended to distinguish between employees who engaged in unlawful strikes or volitionally opted to strike for economic reasons from workers who, through no choice of their own, were compelled to quit their workplace because of abnormally dangerous conditions.

Further analysis of Section 502 in accordance with the canons of statutory construction reinforces the conclusion that the section was intended to relieve employees who confronted abnormal hazards from any burden which might hinder their freedom to engage in a work stoppage.

One of the fundamental rules of interpretation requires that one passage in a statute be read consistently with other parts of the same provision. On applying this rule here, the true purpose of the final sentence in Section 502 becomes abundantly clear. The first few clauses in Section 502 protect employees against involuntary labor.[210] If the final portion of Section 502 is read in a consistent manner, it reasonably follows that Congress intended to prevent employees from having to work against their will when threatened by abnormally dangerous conditions. Congress was concerned with employee protections when involved in a genuine protest of abnormal dangers. In such circmstances it is of no consequence that the protest occurs either before or after the expiration of a contract containing a no-strike clause.

A coherent construction of Section 502 links it far more closely with 501 then with Section 13. In 501, Congress defined a strike to include ''any strike or other concerted stoppage of work by employees (including a stoppage by reason of the expiration of a collective-bargaining agreement). . . . any concerted slowdown or other concerted interruption of operations by employees.'' (Emphasis added.) Having just broadly defined what a strike was as a word of art (including unfair labor practice and economic strikes, as well as strikes which occur after a contract has terminated), Congress took pains to provide in the next section that certain employees' conduct would not be deemed a strike within the definition of 501. Thus Section 502 is titled and intended as a savings provision: work stoppages coming within this section are ''saved'' from the definition of strikes contained in its companion 501. See *Knight-Morley Corp.*, supra at 167. The juxtaposition of these two sections confirms that Congress did not simply regard a cessation of labor as a protected strike.

The Respondent argues that an expansive interpretation of Section 502 would be wholly inconsistent with the intent of Congress which in 1947 was to restrict employee rights. The Taft-Hartley amendments do reflect a congressional preoccupation with union, but not employee, abuses of the strike power. Thus, the avowed purpose of the Taft-Hartley Act was to avoid industrial strife by compelling three separate groups—employers, employees, and unions—to recognize the legitimate rights of one another. In fact, special protections for the individual employee were written into the LMRA. For example, Section 7 was amended to permit employees to refrain from concerted activity. I 1947 Legislative History at 5–6. Section 8(b) was added to create a wholly new category of union unfair labor practices under which an employee could challenge alleged misconduct by a union. In this same spirit, Section 502 was added to safeguard employee rights when workers withheld their labor because of abnormally dangerous conditions. Apparently, Congress recognized that individuals, not the union entity, required protection under such circumstances.

The Respondent also predicts that if employees who refuse to work because of allegedly hazardous conditions are exempt from permanent replacement, then unions will claim that every labor dispute is a health and safety strike under Section 502. A correct construction of Section 502 will not spawn a spate of unsubstantiated claims. Employees do not frivolously walk off their jobs, particularly when their employment may be at risk if they fail to prove by objective evidence that their claims of abnormal dangers were well-founded. Thus, it is the need to adduce objective evidence which deters unjustified work stoppages.

I find nothing in the Act or its legislative history which supports Respondent's parochial view of Section 502 or which indicates that Congress intended to limit that section solely to situations in which employee actions are barred by a no-strike clause. To the contrary, when the normal meaning of the words ''shall not be deemed a strike'' are considered in the context of the Act as a whole, the conclusion is inescapable that Congress meant to protect employees who ceased working because of abnormally dangerous conditions from any impediment, even when their collective-bargaining agreement has expired. Acceptance of a contrary view would thwart the benevolent purpose which underlies Section 502.[211]

---

[208] See *Phelps Dodge Corp. v. NLRB*, 313 U.S. 177 (1941); *American Snuff Co.*, 109 NLRB 885 (1954).

[209] Enfd. 414 F.2d 99 (7th Cir. 1969), cert. denied 397 U.S. 920 (1970).

[210] Sec. 502 begins with the following clauses which precede the section at issue here: ''Nothing in this Act shall be construed to require an individual employee to render labor or service without his consent, nor shall anything in this Act be construed to make the quitting of his labor by an individual employee an illegal act, nor shall any court issue any process to compel the performance by an individual of such labor or service, without his consent . . . .''

[211] Another canon of statutory construction requires that provisions which are calculated to prevent hardship are to be construed in a manner favorable to their benign purpose. See 2A *Sutherland, Statuory Construction*; Sec. 47.01.

3. The case law and Section 502

Respondent also contends that administrative and judicial precedents confirm its view that Section 502 was enacted to protect *only* those employees who engage in work stoppages to protest abnormally dangerous conditions who otherwise would be legally inhibited from such action by a statutory or contractual no-strike clause. Respondent goes further. It claims precedent for the proposition that other employees not subject to a no-strike clause who may be exposed to abnormally dangerous conditions are not covered by the protective cloak of Section 502 even if they engaged in a work stoppage in good faith. I find neither reasoned justification nor support in the judicial and administrative decisions for this position. Certainly there is no square holding by the Board or a court which supports Respondent's contention or which compels me to accept such a purpose.

In *Knight Morley*, supra, one of the earliest cases to discuss Section 502, a shift of employees left work to protest the abnormally dangerous conditions in their work area created by defective ventilatory equipment. In addition to denying the merits of the employees' claim, the employer contended that their work stoppage violated the no-strike clause in their collective-bargaining agreement and refused to permit the protesting employees to return to work.

Although the Board found no legislative history to explain the purpose of Section 502, it noted that at the time the section was enacted, Congress had imposed additional restrictions on employees' right to strike during the term of collective-bargaining agreements. The Board also examined the cases and decisions which denied protection to employees who struck in violation of contractual or statutory no-strike provisions. The Board then concluded that a work stoppage under Section 502 afforded employees the right to walkout; that Congress declared such walkouts not to be strikes even in the face of a no-strike clause in order to protect activity from limitations such as those imposed by 'no strike' clauses or by Section 8(d). In the Board's view, Section 502 was designed to protect the right of employees to quit their labor ''without penalty in order to protect their health and their lives.'' Id. at 146.

The Board's holding in *Knight Morley* is clear. Because of Section 502, a no-strike clause does not bar a work stoppage based on abnormally dangerous conditions. What the Board did not decide also is clear: it did not hold that employees unrestricted by a no-strike clause were excluded from the beneficial coverage of Section 502 if they ceased work to protest abnormally dangerous conditions. Nor did the Board hold that Section 502 permitted such work stoppages only when employees were working under a no-strike prohibition. Indeed, the Board could not properly rule on a question that was not raised by the facts before it.

Since *Knight Morley*, the Board and the courts have discussed Section 502 in diverse factual situations. In many of these cases, the Board withheld the protections of Section 502 on finding that the factual circumstances did not meet the ''abnormally dangerous conditions'' standard.[212] In a handful of cases, the Board has concluded that abnormally dangerous conditions obtained and, consequently, ordered that discharged or locked out employees be reinstated.[213] However, in each of the cited cases, the work stoppage occurred while a no-strike clause was in force.

Gateway Coal Co. v. Mine Workers is the only Supreme Court case to discuss Section 502 at any length, albeit in dicta, for the section was found to of ''ambiguous import'' and inapplicable to the strike in question. 414 U.S. at 377 fn. 8. Disagreeing with the Court of Appeals for the Fourth Circuit, the Supreme Court concluded that the reinstatement of three supervisors who prepared fraudulent reports of air velocity in the mines, did not constitute an abnormally dangerous condition sufficient to invoke the ''special protections'' of Section 502 for the miners' strike. Id. at 385–386. Instead, the court found that the strike was a safety dispute which was subject to arbitration under the parties' collective-bargaining agreement, which thereby gave rise to an implied no-strike obligation. Id. at 379–387. Consequently, the Court held that by violating the no-strike provision, the strike was unlawful and could be enjoined by the District Court under 301 of the Act. Id. at 387. The Court observed in passing that ''this section 502 provides a limited exception to an express or implied no-strike obligation.'' Id. at 385.[214] This one interpretation did not exclude all others.

In both *Gateway* and *Knight Morley*, the Supreme Court and the Board respectively were construing Section 502 in the context of a collective-bargaining agreement containing either an implied or express no-strike clause. Neither tribunal had occasion to deliberate or rule on the question of Section 502's application to a work stoppage over abnormally dangerous conditions which occurs in the absence of a contractual or statutory no-strike clause. Generally, courts do not rule on issues which are not presented for or necessary to resolution of the matters before them.

Respondent finds some support for its position in a few court and Board decisions which contain statements indicating a restricted reading of Section 502. For example, in *Tamara Foods v. NLRB*, supra at 1183, the court of appeals remarked in dicta that Section 502 does ''not modify Section 7 of the Act'' and was not relevant to the case at hand since ''there was no collective-bargaining agreement'' to trigger application of the section. The *Tamara Foods* Court cited *Gateway Coal* and *Whirlpool Corp.* as authority for its position; yet, neither of these cases hold that the sole effect of the section is to create an exception to a no-strike obligation in a collective-bargaining agreement. Moreover, the circuit court's belief that Section 502 does not modify 7 is not held by other appellate courts which have enforced Board decisions finding that Section 502 could be translated into 7 rights. See, e.g., *NLRB v. Knight Morley Corp.*, supra, *Philadelphia Marine Trade Assn. v. NLRB*, supra.

Several administrative law judges also have suggested in intermediate decisions that Section 502 serves only to remove work stoppages over abnormally dangerous conditions from the reach of no-strike clauses. See, e.g., *American Home Systems*, 200 NLRB 1131 (1972), enfd. 482 F.2d 947 (6th Cir. 1973). I do not find such pronouncements controlling, particularly in light of the Board's explicit statement in

[212] See, e.g., *Beker Industries Corp.*, supra; *Stop & Shop*, 161 NLRB 75 (1966); *Anaconda Aluminum Co.*, 197 NLRB 336 (1972).

[213] See, e.g., *Knight Morley Corp.*, supra; *Fruin-Colnon Construction Co.*, supra; *Philadelphia Marine Trade Assn.*, supra; *Combustion Engineering*, supra; *Richmond Tank Car Co.*, supra.

[214] Accord: *Whirlpool v. Marshall*, supra at 18 fn. 29 (1980).

Beker Industries Corp., supra at 975 fn. 1, that it would reserve ruling on the very question at issue here. In *Beker*, a case involving neither an express or an implied no-strike clause, the administrative law judge found with Board approval, that an employee who withheld his services after the effects of an explosion dissipated, had reacted unreasonably since abnormally dangerous conditions no longer obtained. The Board commented that ''the factual predicate of Section 502 not having been established, the issue whether Section 502 modifies Section 7 is moot, and we intimate here no prediction of our ultimate resolution of the question when and if the issue is presented to us squarely.'' Id.

Based on the foregoing discussion, I find no case construing Section 502 which is either mandatory or persuasive authority for the conclusion that Congress intended to limit Section 502 solely to those situations in which employees protest abnormally dangerous conditions in disregard of no-strike clauses.

4. Section 502 work stoppages are not safety strikes

Respondent further argues that because the protest at TNS was not directed against any conduct which the Board is empowered to correct, the employees may not be treated as unfair labor practice strikers in accordance with the General Counsel's theory. Rather, Respondent asserts that since the dispute concerned health and safety conditions which are traditionally treated as economic issues, the employees were engaged in an economic strike. Accordingly, the Respondent insists that it lawfully hired permanent replacements and legitimately refused reinstatement to the strikers until appropriate vacancies became available.[215] I am not persuaded by this argument. On the contrary, I conclude that employees engaged in a work stoppage protesting abnormally hazardous conditions are not engaged in an economic strike and may not be permanently replaced.

Respondent relies principally on Gateway Coal which it claims laid to rest any notion that a Section 502 work stoppage was distinct from an economic dispute over safety conditions. Respondent's reliance on Gateway is misplaced; that case refutes rather than supports Respondent's thesis.

Supreme Court found that under the circumstances present in Gateway, the strike was not sui generis since ''the claim concerns not some identifiable, presently existing threat to the employees' safety, but rather a generalized doubt in the competence and integrity of company supervisors.'' Gateway, supra at 386. Thus, the Court clearly distinguished between a protest over abnormally dangerous conditions from a run-of-the-mine safety dispute. As to the former situation, the Court stated ''a work stoppage called solely to protect employees from immediate danger is authorized by Section 502 and cannot be the basis for ''either a damages award or a Boys Market injunction'' Id. at 385.[216] Thus, Gateway posits that labor disputes involving non-hazardous safety issues should be submitted to arbitration in accordance with the parties' agreement, and strikes over such issues may be enjoined as violative of implied or express no-strike agreements. That decision in no way supports Respondent's contention that work stoppages which are proven to be about abnormally dangerous conditions must be handled in the same way.

If Respondent's analysis of *Gateway* were adopted, it would lead to bizarre results. Employees would have to continue working under abnormally dangerous conditions while arbitration or some other form of adjudication went forward. As Judge Hastie said for the majority in the *Gateway* court of appeals decision: ''men are not wont to submit matters of life or death to arbitration and no elightened society encourages, much less requires them to do so,'' 466 F.2d 1157, 1160. Supreme Court Justice Douglas, dissenting in *Gateway*, added that ''The words of Section 502 recognize in law what is in any case an unavoidable principal of human behavior: self preservation.'' *Gateway Coal*, supra at 392. It is unreasonable to assume that any court would demand that employees submit to protracted legal proceedings while their health or their very lives were in jeopardy. It follows from Gateway that since Section 502 work stoppages are not coterminous with safety disputes which are subject to the normal rules of arbitrability or injunctive relief, neither are they subject to the legitimate rules of permanent replacement for economic strikers.

Respondent cites *Keystone-Seneca Wire Cloth Co.*, 244 NLRB 398, 400 (1979), and several other cases which purportedly bolster its argument that all health or safety disputes are treated generically as economic strikes. However, in *Keystone-Seneca*, the administrative law judge specifically found that Section 502 did not apply. Id. at fn. 8. More importantly, as the August 11, 1983 Order in this case aptly notes, ''a strike protected by Section 502 is not a refusal to work to protest alleged unsafe conditions but to protest abnormally unsafe working conditions '' which must be proved by ascertainable objective evidence . . . .'' (Emphasis in the original.) Thus, in Seneca-Wire, the administrative law judge observed that employees' alleged claims of safety hazards must merely be reasonable; they need not be correct. (Emphasis added.)[217] In contrast, a claim under Section 502 must be more than merely reasonable. The striking employees' claims must be made in good faith and competent evidence must be adduced which shows that under the circumstances their apprehensions were reasonable. *Redwing Carriers*, supra; *Richmond Tank*, supra.

If, as Respondent asserts, a work stoppage addressed to abnormally dangerous conditions may be treated exactly as an economic strike involving health and safety issues, Section 502 would have no independent purpose. Section 13 would be sufficient to protect such strikes against any limitation or qualification. It cannot be presumed that Congress would have engaged in a meaningless, redundant gesture in enacting Section 502. See 2A Sutherland, Statutory Construction, 45.12. Therefore, the inference must be drawn that Sec-

[215] Respoondent's argument compels it to maintain that it could permanently replace its employees even if their strike over abnormally dangerous conditions occurred during the term of the collective-bargaining agreement. Respondent's position would totally eviscerate the ''special protection'' which Sec. 502 extends to employees. See *Gateway Coal*, supra at 387.

[216] The Supreme Court disagreed with and reversed the court of appeals' conclusion that an honest but subjective belief was sufficient to invoke the protections of Sec. 502. See *Gateway*, supra at 385–386.

[217] The other cases cited by Respondent; i.e., *Markle Mfg. Co.*, 239 NLRB 1353, 1355 (1979) (complaints about safety rules); *Precisions Castings Co.*, 233 NLRB 183 (1977); and *Pacific Powder Co.*, 84 NLRB 280, 284 (1949), are equally inapposite.

tion 502 has a purpose beyond that which might be supplied by Section 13. The purpose is manifest from the text—a work stoppage caused by abnormally dangerous conditions ''shall not be deemed a strike'' within the intendment of either 13 or 501. A cross-reference from Section 13 to Section 502 which appears in the index to the 1947 Legislative History suggests that Section 502 saves or exempts work stoppages over abnormally dangerous conditions from the limitations and qualifications imposed by Section 13 on conventional strikes.

Respondent cites *Meyers Industries*, 268 NLRB 493 (1984),[218] as a bellweather of the Board's intent to treat health and safety issues with no greater solicitude than other economic matters. Respondent misreads the import of *Meyers.* The question in *Meyers* was whether the Board had jurisdiction to act in a case where there was no evidence of actual concerted activity. The Board declined to presume concerted activity and decided that without evidence of actual concerted activity, it had no statutory jurisdiction to act on the complaint. The Board did not depart from its previous position expressed in *Alleluia Cushion Co.*, 221 NLRB 999, 1000 (1975), that safe working conditions are ''matters of great and continuing concern for all workers within the work force'' or that occupational safety is ''one of the most important conditions of employment.'' It simply did not broach the question of whether health and safety issues would be treated on a par with economic matters and certainly made no pronouncement that a matter involving abnormally dangerous conditions would be treated as an ordinary economic issue.[219] Far from disavowing concern over the plight of the employee in that case, the Board stated that in the absence of concerted activity, ''Although we may be outraged by a Respondent who may have imperiled public safety, we are not empowered to correct all immorality or illegality arising under all Federal and state laws.'' Id. at 499. In the instant case, unlike *Meyers*, the employees' activity was unquestionably concerted and the Board has the power to act. Section 502 provides express authority for protecting the interests of employees who are engaged in a work stoppage over abnormally dangerous conditions.[220]

Having concluded that a Section 502 work stoppage is not an economic strike, it follows that Respondent did not have the option of permanently replacing its employees. Indeed, the rationale supplied by the Supreme Court in *Mackay* to legitimize the practice of hiring permanent replacements makes no sense when applied to a Section 502 work stoppage. In *Mackay*, the Court did not suggest that replacement and discharge were dissimilar in their impact on employees. Rather, in *Mackay*, the Court was weighing two equally valid interests of parties engaged in a purely economic struggle; those of an employer who wishes to continue running his business against those of employees who voluntarily chose to strike about the terms and conditions of their employment. On balancing these concerns, the Court found that the scales tilted in the employer's favor.

The same equities do not pertain to a Section 502 work stoppage. Assuring economic peace, one of the Act's ultimate purposes, is not a sine qua non when a work stoppage is caused by abnormally dangerous conditions. Since *Mackay*, employees have known that permanent replacement is a legally approved incident of economic struggle. But when employees are compelled to leave their work place because of excessive hazards, an employer does not have a right to continue doing business as usual. In such circumstances, the burden of risk must be borne by the employer not the employee. The special protections afforded to Section 502 strikers would be illusory if all that it meant was that they could anticipate permanent replacement. Permanent replacement would present employees with precisely the dilemna that Section 502 was meant to prevent—that is, from risking their lives without fear of losing their jobs. Neither can it be said that TNS stands in exactly the same shoes as the *Mackay* employer for when abnormally dangerous conditions prevail, ''the health and safety of working people take precedence over the easing of industrial strife.'' *Pence Construction Corp. v. Hoisting & Portable Engineers Local 450*, 484 F.2d 398, 402 (5th Cir. 1973).

The foregoing discussion leads to the conclusion that ''when a work stoppage results from abnormally dangerous conditions, an employer may not resort to the same weapons available in economically motivated work stoppage. We agree . . . that the very nature of the two types of work stoppages (economic and Section 502) are entirely different.'' *Clark Engineering and Construction Co. v. Carpenters*, 510 F.2d 1075, 1079 (6th Cir. 1975).

In *Philadelphia Marine*, the Board and the court of appeals recognized that a lockout was lawful when used as a defense in a wholly economic struggle with the Union. However, both tribunals viewed such conduct differently when the employer locked out longshoremen who refused to unload a ship's cargo of heavy bales of sugar using an admittedly dangerous pallet rather than slings. On these facts, the court, affirming the Board, stated that an employer may not lock out employees who are engaged in a work stoppage over abnormally dangerous conditions. If a lockout, an approved strategic instrument in an economic dispute, is an illegimate weapon when used against employees in a Section 502 work stoppage, it follows, a fortiorari, that permanent replacement also is not a weapon available to an employer in such circumstances.

Permanent replacement obviously may affect employees in just the same way as discharge.[221] It is important to bear in

[218] Enf. denied and remanded sub nom. *Prill v. NLRB*, 755 F.2d 941 (D.C. Cir. 1984), cert. denied 54 U.S. L.W. 3310 (1985); on remand 281 NLRB 882 (1986).

[219] On remand, the Board affirmed its decision in *Meyers I* stating that a literal reading of ''concerted'' activity was a reasonable construction of Sec. 7, even if not mandated by the statute. See *Meyers II*, supra.

[220] See *BASF-Wyandotte Corp.*, 274 NLRB 978 (1985), where the Board reasoned that it was proper to consider an employer's defense based on its obligations under Sec. 302 in determining whether Sec. 8 was violated, since both sections were encompassed within the LMRA and construction of Sec. 302 was within the Board's competence. Id. at 979. The Board also noted that it had considered other LMRA provisions in determining whether a violation of Sec. 8 had occurred, citing *Combustion Engineering*, supra, where it held an employer's discharge of employees who ceased working when threatened by assault, was in disregard of Sec. 502 and, therefore, a violation of Sec. 8(a)(1). Id. at 975 fn. 5.

[221] In *NLRB v. Rockaway News Supply Co.*, 345 U.S. 71, 75 (1953), the Supreme Court found the Board's attempt to distinguish between discharge and replacement ''unrealistic and unfounded in law . . . .'' The Court further recognized as a pragmatic matter that

Continued

mind that only since 1968 were replaced workers accorded the possibility of reinstatement pursuant to *Laidlaw Corp.*, decision.[222] An employer had no duty to maintain a preferential hiring list at the time Section 502 was enacted. Consequently, the Board's reasoning in *Knight Morley* that the purpose of Section 502 was to protect employees from any penalty, is as applicable to the penalty of permanent replacement as it is to discharge. Even today unless employees are reinstated, permanent replacement still results not only in the loss of one's job but also may entail the elimination of pension, seniority or other rights acquired during years of service. Certainly, for most of the TNS strikers, permanent replacement bore grave consequences. Prior to the hearing Respondent recalled only 12 of the approximately 100 strikers.[223] In sum, employees engaged in a Section 502 work stoppage are not strikers and may not be permanently replaced. Rather, employees, such as those at TNS, who in good faith engage in a Section 502 work stoppage at the expiration of their collective-bargaining agreement are entitled to the special protections of that section. Therefore, for the reasons set forth above, which amplify those provided in the August 11, 1983 Order, the complaint states a valid cause of action on which relief may and should be granted. It follows that Respondent's motion to dismiss was and hereby is denied.

E. *Respondent Violated Section 8(a)(3) and (1)*

When, as here, employees are improperly treated as economic strikers in defiance of the special protection afforded by Section 502, 7 rights also are implicated. It is well-established that employees who withhold their labor because of abnormally dangerous conditions are engaged in concerted activity for their mutual aid and protection within the meaning of 7 of the Act and ''may quit their labor without penalty to protect their health and lives.'' *Knight Morley Corp.*, supra at 46; *Philadelphia Marine Trade Assn.*, supra; *Richmond Tank Car Co.*, supra. What, then, are the special protections to be accorded to employees who engage in Section 502 work stoppages.

The Respondent insists that the Board is not empowered to provide a remedy under Section 10(a) of the Act even if it is assumed that TNS was responsible for maintaining or failing to correct abnormally dangerous conditions, for such conduct is not condemned as an unfair labor practice.[224] Respondent misses the point. Its negligence or culpability in failing to correct abnormally dangerous working conditions is not the unfair labor practice alleged in this complaint.[225] Respondent's unlawful conduct under the Act stems from permanent replacing and refusing to reinstate its employees as if they were economic strikers.

Threatened with permanent replacement, the TNS employees were confronted with a Hobson's choice: either return to work and suffer abnormal hazards or continue striking and forfeit their jobs. Employees who legitimately cease work out of need to avoid consummated injury from abnormally dangerous conditions may not be put to such a test at the very time when their need to strike is the greatest.

Extended discussion is not required at this point to support the inference that permanent replacement tends to discourage employees from exercising their statutory right to engage in concerted activity for mutual aid and protection. Accordingly, by threatening to replace and permanently replacing the striking TNS employees, and by refusing to reinstate them when they offered to return without condition, Respondent interfered with, coerced and restrained its employees in the exercise of their Section 7 rights, thereby violating Section 8(a)(1) of the Act.

A separate question arises as to whether Respondent's conduct also violates Section 8(a)(3) of the Act, for there is no direct evidence here that Respondent intended to discriminate against the employees because of their union membership.[226] Usually where a violation of Section 8(a)(3) is alleged, proof of the employer's discriminatory intent or motive is the test of whether there is unlawful encouragement or discouragement of concerted activity or union membership. See *NLRB v. Erie Resistor Corp.*, 373 U.S. 221, 233 (1963). However, specific direct proof of improper intent or motive is not always required and the violation may be implied as a matter of law. See *Radio Officers Union v. NLRB*, 347 U.S. 17, 42–43 (1954); *NLRB v. Great Dane Trailers*, 388 U.S. 26 (1967). ''Some conduct . . . is so 'inherently destructive of employee interests' that it may be deemed proscribed without need for proof of an underlying improper motive . . . .' In other words, some conduct carries with it 'unfavorable consequences which the employer not only foresaw but which he must have intended' and thus bears 'its own indicia of intent.''' (Citations omitted.) *Great Dane Trailers*, supra at 33. ''If it can reasonably be concluded that the employer's discriminatory conduct was 'inherently destructive' of important employee rights, no proof of an antiunion motivation is needed and the Board can find an unfair labor practice even if he employer introduces evidence that the conduct was motivated by business considerations.'' Id. at 34.

Applying the principles of *Great Dane Trailers* to this case, it is fair to conclude that the Respondent's conduct was inherently destructive of its employees' right to engage in concerted activity for their mutual aid and protection, even without evidence of antiunion motivation. Clearly, the Respondent ''not only foresaw'' but ''must have intended'' to woo employees away from their strike protest when it advised them that they would be permanently replaced unless they returned to work. Denying the employees reinstatement

---

the distinction between permanent replacement and discharge ''is not based on any difference in effect on the employee. . . . Substantive rights and duties in the field of labor-management do not depend on verbal ritual reminiscent of medieval real property law.'' Id.

[222] 171 NLRB 1366 (1968), enfd. 44 F.2d 99 (7th Cir. 1979).

[223] Nine former strikers reported to work on August 3, 1981, with the first group of replacements.

[224] Sec. 10(a) empowers the Board ''to prevent any person from engaging in any unfair labor practice (listed in Section 8) . . . .''

[225] An employer could be entirely innocent of causing the hazardous conditions which lead to a Sec. 502 work stoppage. See, e.g., *Combustion Engineering*, supra. Here, however, Respondent's failure to take corrective action is relevant to determining whether the dangerous conditions could have been prevented, and, therefore, considered inherently rather than abnormally dangerous.

[226] Sec. 8(a)(3) of the Act makes it an unfair labor practice for an employer ''by discrimination in regard to hire or tenure of employment or condition of employment to encourage or discourage membership in any labor organization.''

also had to undermine their belief that concerted activity or Union membership would be productive.

Since, as a matter of law, Respondent was not entitled to permanently replace its striking employees, its effort to supply a legitimate reason for doing so is unavailing.[227] Practices which may be condoned in ordinary economic disputes have no currency here. Proferring an otherwise sound business purpose cannot outweigh the harm that is done by compelling employees to surrender their right of self-defense.[228] Consequently, in the circumstances present here, proof is not required that Respondent's actual or subjective motive discouraged the employees' union activity. Discrimination is presumed where, as here, the Respondent's conduct tended to discourage the employees' involvement in concerted activity and continued adherence to the Union.

The Supreme Court has recognized that Congress conferred on the Board broad discretion to meet specific situations where normal modes of relief would not suffice to right the wrong. In the leading case of *Phelps Dodge Corp. v. NLRB*, supra at 194, Justice Frankfurter stated that Court's view of the Board's powers in this area:

> [I]n the nature of things Congress could not catalogue all the devices and stratagems for circumventing the policies of the Act. Nor could it define the whole gamut of remedies to effectuate these policies in an infinite variety of specific situations. Congress met these difficulties by leaving the adaptation of means to end to the imperic process of administration.

In keeping with the broad mandate conferred by Section 10(c) of the Act, the Board has extensive authority to order an employer to cease an unfair labor practice and to compel reinstatement of employees with backpay when their employment has ceased as a consequence of an unfair labor practice. See *NLRB v. Columbian Enamelling Co.*, 306 U.S. 292 (1939); see also *Mastro Plastics Corp. v. NLRB*, 350 U.S. 270, 278 (1956) (unfair labor practice strikers entitled to reinstatement even after employer hired permanent replacements). The Board also has exercised its remedial powers to reinstate and award backpay to employees who engaged in a work stoppage within the meaning Section 502 as if they were unfair labor practice strikers. See, e.g., *Knight Morley Corp.*, supra at 153; *Richmond Tank*, supra at 176.

Analogizing Section 502 strikers to unfair labor practice strikers is altogether fitting in light of the Board and Supreme Court's avowed special concern for employees who protest unsafe or unhealthy working conditions. Thus, in *NLRB v. Washington Aluminum Co.*, 370 U.S. 9, 1962, the employer was ordered to reinstate unrepresented employees who were discharged after leaving the shop without permission, having complained that the severe cold prevented them from continuing to work there. On affirming the Board's ruling that the employees were engaged in protected concerted activity protected by Section 7 of the Act, the Supreme Court observed:

> Concerted activities by employees for the purpose of trying to protect themselves from working conditions as uncomfortable as the testimony and Board findings showed them to be in this case are unquestionably activities to correct conditions which modern labor management legislation treats as too bad to be tolerated in a humane and civilized society like ours.

If employees who protest working conditions which are merely ''uncomfortable'' are entitled to reinstatement and backpay, certainly, employees who in good faith cease working to protect themselves from the greater life-threatening risks of depleted uranium are entitled to no less.[229]

Conclusion

On both the facts and the law, this case is one of first impression. Thus, it has been necessary to give careful consideration to the precise words of the statute and to legislative history. It has been equally important to determine congressional intent and purpose by looking at ''the penumbra of expressed statutory mandates'' for ''the policy of the legislation and fashioning a remedy that will effectuate that policy.'' *Textile Workers v. Lincoln Mills*, 353 U.S. 448, 457 (1957).

The language of Section 502 has been carefully examined. It is plain enough on its face, stating unequivocally that workers who withhold their labor to protect themselves from abnormally dangerous working conditions shall not be deemed strikers. The legislative history of the Taft-Hartley amendments does not speak directly to the purpose of Section 502, but a construction of that section which removes protests over abnormally dangerous conditions from penalties of any sort offends no other section of the Act, is supported by the legislative history and is rationally related to the socially benevolent purposes of the Act. This conclusion is neither inconsistent with nor a departure from precedent. The NLRA, as amended, was designed to equalize and stabilize the relationship of employer and employee in order to achieve industrial peace. However, when abnormally dangerous conditions drive employees from their work place, the employer may not oppose the employees' protest with conventional weapons available to it in an ordinary economic struggle.

In the final analysis, I am persuaded that Section 502 protects the TNS employees who ceased working in the face of abnormally dangerous working conditions from permanent replacement, even though their collective-bargaining agree-

[227] Even if I had to reach the question of whether Respondent had a sound business justification, I would find its evidence unconvincing. As noted previously, Respondent claimed that TNS resumed operations in order to fulfill its contract to produce penetrators for the U.S. Air Force. Yet, at a collective-bargaining session on July 16, 1981, TNS officials told Union negotiators that there was no need for penetrators and never resumed such production after the strike began. Moreover, an employer's right to hire permanent replacements during an economic strike rests on the presumption that the new employees would not fill vacancies unless they were offered permanent status. In the present case, this presumption is questionable since 1500 candidates competed for approximately 100 vacancies.

[228] Cf. *NLRB v. Erie Resistor Corp.*, supra, where the Supreme Court held the existence of a legitimate business purpose did not justify an unfair labor practice.

[229] It would be incongruous if unorganized workers, such as those in *Washington Aluminum*, were entitled to greater protections than those who are organized and cease working only after they have failed to persuade their employer to correct abnormally dangerous working conditions.

ment containing a no-strike clause had expired. This conclusion is consistent with the letter and spirit of Section 502 and effectuates the purposes of the Act by fairly adjusting the interests of employer and employees in a changing and technologically sophisticated society.

II. THE 8(A)(5) AND (1) VIOLATIONS

Three issues remain in this case: (1) whether Respondent violated 8(a)(1) of the Act through statements to employees regarding the seniority of reinstated strikers; (2) whether Respondent violated 8(a)(5) and (1) of the Act by withdrawing recognition from and refusing to bargain with the Union; and (3) whether Respondent violated the *Laidlaw* rights of the striking employees. The conclusions reached in foregoing parts of this Decision in large measure determine the disposition of these final issues.

A. *Independent 8(a)(1) Violation*

At an unspecified time in 1983, Dr. Schell assured the replacement employees that any returning strikers would not be reinstated with their original seniority intact. Later, in September 1983, after learning that reinstated strikers retained their seniority as a matter of law, Dr. Schell apologized to the current work force for having previously misinformed them. A similar retraction was delivered in January to other employees by TNS official, Frank Ward.

Respondent's efforts to cure these earlier mistakes may have succeeded in giving the replacements correct information concerning their seniority, but they also were likely to breed insecurity and resentment toward those whose return would undermine the higher rank they thought they enjoyed. Employees are not likely to welcome announcements which shatter their seniority status. Respondent's remarks would naturally tend to fan the replacements' hostility against the reinstated strikers and the Union. Accordingly, Dr. Schell's and Ward's statements served to restrain and interfere with the employees' Section 7 rights to participate in concerted protected activity without coercion, thereby violating 8(a)(1) of the Act.

B. *Respondent Unlawfully Refused to Bargain*

The complaint in Case 10–CA–18785 alleges that the Respondent failed to bargain in good faith with the Union. Denying this accusation, Respondent contends that it lawfully withdrew recognition based on a good-faith doubt that the Union continued to enjoy majority support, formed after receiving a petition on May 4, 1982, in which 70 of 73 current employees indicated that they did not wish to be represented by OCAW.

It is well-settled doctrine that an employer may not evade its duty to bargain by relying on a claimed loss of majority support attributable to its own unfair labor practices. This principle was restated in *Master Slack Corp*., 271 NLRB 78, 84 (1984):[230]

> it is clear that prior unremedied unfair labor practices remove as a lawful basis for an employer's withdrawal of recognition the existence of a decertification petition or any other loss of union support which, in other circumstances, might be considered as providing objective considerations demonstrating a free and voluntary choice on the part of employees to withdraw their support of the labor organization.

Not every unremedied unfair labor practice will suffice to prove that the union's loss of majority support was attributable to an employer's misconduct. In order to find that professed doubts are tainted, the employer's conduct must be of ''such character as to either affect the Union's status, cause employee disaffection, or improperly affect the bargaining relationship itself.'' *Colonial Manor Convalescent Center*, 188 NLRB 861 (1971). Accord: *Guerdon Industries*, 218 NLRB 656, 661 (1975). These criteria require a finding that the Respondent's unlawful conduct must be causally related to the employees' May 3 petition. See *Master Slack Corp.*, supra at 84, citing *Olson Bodies, Inc.*, 206 NLRB 779 (1973).

In *Olson Bodies*, the following criteria were cited as appropriate guages of whether a causal relationship was established: the length of time between the unfair labor practice and the withdrawal of recognition; the nature of the illegal act, including their detrimental or lasting impact; whether the union had contributed to employee disaffection, and the effect of the unlawful conduct on employee morale, organizational activities and membership in the union. Id. at 785.

Here, Respondent's unfair labor practices; i.e., the hiring of permanent replacements and refusing to reinstate the former strikers, took place several years before the replacement employees' petition was drafted. Nevertheless, this lapse of time could not possibly have diminished the lasting impact of Respondent's unremedied unlawful conduct on the replacements. Were it not for such conduct, the replacements would not have been employed and, therefore, could not have circulated the petition. In addition, the anger which some of the picketers vented on their replacements during the earliest phases of the strike, and the tensions inevitably generated by this litigation (which, in effect, was aimed at reversing the Respondent's unfair labor practices, and ousting the replacements) could not have endeared the new TNS employees to the Union. Accordingly, it is fair to infer that Respondent's conduct contributed significantly to the replacement employees' desire to rid themselves of Union representation.[231] Consequently, Respondent was not privileged to to claim a good-faith doubt of OCAW's continued majority status.[232] It follows that the Respondent's refusal to bargain violated Section 8(a)(5) and (1) of the Act.

C. *The Laidlaw Issues*

Having concluded that the TNS employees are entitled to relief analogous to that accorded to unfair labor practice strikers, it is unnecessary to determine whether Respondent violated their reinstatement rights as if they were economic strikers. However, assuming arguendo that the employees were engaged in an economic strike, the following section of this Decision will consider whether the Respondent fulfilled

[230] Quoting *Pittsburg & New England Trucking Co.*, 249 NLRB 833, 836 (1980). See also *Burger Pitts, Inc.*, 273 NLRB 1001, 1002 fn. 15 (1984); *Scott Printing Corp.*, 249 NLRB 946 (1980), and cases cited at fn. 4.

[231] Cf. *Burger Pitts, Inc.*, supra.

[232] Were it not for Respondent's unfair labor practices, I would find that the employees petition provided a sufficient basis for a good-faith doubt of the Union's majority status. See *Master Stack*, supra; *Industrial Waste Service*, 268 NLRB 1180 (1984).

its responsibilities toward the strikers with respect to their reinstatement rights under prevailing precedent.

1. The facts

Some 98 to 100 employees participated in the work stoppage.[233] By February 15, 1982, when the Union submitted an unconditional offer to return on behalf of its members, 18 of the original strikers were no longer employed at TNS. Ten others had returned to work and Respondent recalled an additional 13 employees in 1983 as vacancies arose, leaving approximately 57 former strikers available for reinstatement. Respondent acknowledges that by February 15, 1982, 70 to 75 new employees had been hired for positions other than those in the penetrator shop, which was not reopened subsequent to the strike.

In addition to resuming operations in the foundry, Respondent opened a new machine shop in the plant in the winter of 1982 to produce a larger and somewhat different version of the penetrator. Among the new equipment installed to fabricate this antitank projectile were ''CNC'' (computer numerically controlled) lathes. The CNC lathe differed from the conventional machine previously used at TNS in that a computer program controlled the depth and location of the cuts and grooves made to the projectile part.

In order to operate this technologically advanced equipment, Respondent recruited 8 to 11 employees for a new job category titled ''CNC specialist.'' The job duties of the specialist were described as follows:

> Under minimum supervision operates CNC and, if required, conventional shop machines. Must be capable of making own set-ups. Performs computer program adjustments; makes own tool changes. Operates the machine(s) to blueprint specifications. Loads, unloads, moves parts to/from machinery. Remove, replace and reset damaged tooling, performs in process inspection, check own work with optical comparator scale, micro meters, and fixed gauges to maintain close tolerance and obtain samples for lab analysis.

Four to five years experience on the CNC, NC or conventional shop machines was required with a minimum of 2 years actual experience on CNC of NC equipment. The rate of pay was $9.20 to $9.63 an hour; over a $1 more per hour than was paid to the CNC operator.

In September 1983, Respondent posted job notices in the plant announcing that three CNC specialists positions were available. However, no bids were received. Shortly thereafter, the CNC specialist notice was withdrawn and notice was posted for three CNC operators. After 5 days, this notice was retracted. As Manager of Industrial Relations Sparks explained, his secretary inadvertently posted the second notice, assuming incorrectly that the specialist positions would be filled by current operators thereby leaving three operator positions vacant.

[233] Although the parties disagree and the record is unclear as to the precise number of employees who engaged in the strike and were entitled to reinstatement rights, this problem can be resolved at the compliance stage of the proceeding.

2. The parties' contentions

The Respondent contends that because all of the available positions left vacant by the so-called economic strikers were filled by permanent replacements, it had no legal duty to reinstate the former TNS employees except when vacancies occurred. Respondent also contends that since none of the former strikers possessed the skills required for the CNC specialist position, 8 to 11 new employees were hired for this classification. The General Counsel maintains that the Respondent violated the striking employees' reinstatement rights in three respects: (1) Respondent failed to prove that the replacement workers were not hired as temporaries who could be displaced by returning strikers; (2) failed to reopen the penetrator shop as required and (3) failed to recall the eligible TNS strikers for the CNC positions.

3. The governing legal principles

The two most important cases which govern the reinstatement rights of economic strikers are *NLRB v. Fleetwood Trailers Co.*, 389 U.S. 375 (1967), and *Laidlaw Corp.*, supra. Speaking for the majority in *Fleetwood Trailers*, Justice Fortas said:

> If an employer refuses to reinstate striking employees, . . . it is an unfair labor practice . . . unless the employer can show that his action was due to ''legitimate and substantial business justifications'' . . . . The burden of proving justification is on the employer.

The Court recognized two such justifications:

> One is when the jobs claimed by the strikers are occupied by workers hired as permanent replacements during the strike in order to continue operations . . . .
>
> A second basis is . . . when the striker's job has been eliminated for substantial and bona fide reasons other than considerations relating to labor relations: for example, ''the need to adapt to changes in business conditions or to improve efficiency.'' [Citation omitted. Id. at 379.]

In light of *Fleetwood*, the Board held in *Laidlaw*, supra at 9, 10, that economic strikers remain employees indefinitely even after they are replaced. Therefore, they are entitled to reinstatement as vacancies arise absent substantial business justification and regardless of antiunion animus.

4. Replacements were offered permanent positions

The General Counsel argues that Respondent failed to prove that the new employees were hired on a permanent basis; therefore, it must be assumed that they were temporary employees who should have been dismissed to make way for their predecessors when they offered unconditionally to return to work. Both testimonial and documentary evidence refutes the General Counsel's argument in this regard.

Sparks testified without contradiction, that on instructions from his superiors, he recruited, interviewed and hired employees for permanent positions at TNS. Support for his testimony comes from two sources. First, Respondent wrote to all striking employees in mid-July to advise them that if they did not return, their positions would be filled by permanent replacements. Second, Respondent placed advertisements in a

number of local newspapers which contined employment applications plainly stating that TNS was seeking candidates for permanent positions. In light of this uncontested evidence, I conclude that Respondent has sustained its burden of proving that the replacement employees were assured permanent employment at TNS. Cf. *Covington Furniture Mfg. Corp.*, 212 NLRB 214, 221 (1974).

5. Penetrator shop positions should be restored

The General Counsel next argues that since the Respondent failed to prove that operations in the penetrator shop were curtailed for substantial and legitimate purposes, the striking employees were entitled to be reinstated to operator positions there.

During poststrike collective bargaining, the Respondent stated, without elaboration, that it had not resumed operations in the penetrator shop for business reasons. The record provides no clarification as to what those business reasons may have have been. In fact, the evidence suggests that Respondent was fully prepared to resume operations there. Thus, during collective-bargaining meetings in 1982, Respondent's officials assured the union representatives that the penetrator shop equipment was in place at the plant; they even solicited the Union's advice on whether production should commence. The Union's position at that time, like that taken by the General Counsel in its brief, was that Respondent was legally obliged to reopen the penetrator shop.

The Respondent's bald assertion that business reasons accounted for its decision to curtail operations in the penetrator shop does not satisfy the Supreme Court's requirement that an employer provide substantial and bona fide justification for its refusal to reinstate employees when jobs have been abolished. See *Fleetwood Trailers*, supra at 379. Nor does Respondent's claim of a business purpose make any sense in light of its assertion that operations were resumed in August 1981 in order to meet its government contract. Since that contract was for the purchase of penetrators, the failure to reopen the penetrator shop is inexplicable. Accordingly, I find that the Respondent has failed to meet its burden of establishing that the abolition of jobs in the penetrator shop was legitimately motivated. Cf. *Bushnell's Kitchen, Inc.*, 222 NLRB 110, 117–118 (1976). No proof of a discriminatory motive is necessary to sustain the conclusion that the refusal to reinstate striking employees to positions in the penetrator shop violates Section 8(a)(3) and (1) of the Act.

6. The strikers were not qualified to be CNC specialists

The Respondent contends that none of the striking employees had the skills needed to fill the CNC specialist position. Counsel for the General Counsel do not dispute the fact that an employee must possess several new skills in order to operate the CNC lathe. Neither do they suggest that the striking employees had the experience or training to operate these lathes. However, they assert that apart from the ability to set up the lathe and adjust its computer program to compensate for changes in tolerance which occurred during the manufacturing process, the lathe was a simple instrument to operate and did not require extraordinary skills. Therefore, relying primarily on *Lehigh Metal Fabricators*, 267 NLRB 568 (1983), they contend that the Respondent was obliged to recall the TNS strikers and test their abilities to run the CNC lathe to determine whether they were qualified.

I do not agree that an employer is obligated to give inexperienced employees a trial run on complex, new machinery. *Lehigh Metal Fabricators* does not compel a different conclusion. In that case, the question was whether two unreinstated employees who were experienced welders prior to a strike, were skilled enough to meet the employer's upgraded standards to weld new metal materials. A judgment about their competence depended completely on the employer's subjective appraisal. In these circumstances, the administrative law judge appropriately determined that the employees should be afforded an opportunity to prove whether they were capable of performing the work. In the present case, no subjective judgment is required to comprehend that a CNC lathe specialist needs special training and experience to set up the complex equipment and adjust the computer program to fine tolerances. The General Counsel failed to adduce evidence which would show that any striking employee had the training or experience to perform such tasks. The fact that no TNS operator (including the reinstated strikers) bid on the specialist positions posted in September 1983 suggests that that job was not quite as simple as General Counsel contend. For the foregoing reasons, I am persuaded that the Respondent has demonstrated that the CNC specialist position required advanced technological skills which the TNS workers did not possess. Accordingly, Respondent has sustained its burden of proving that it did not recall any strikers for these positions for legitimate and substantial business reasons.

III. THE REMEDY

Although the employees who engaged in the work stoppage between May 1, 1981, and February 15, 1982, are not considered strikers by the terms of Section 502, it is reasonable and appropriate to analogize them to unfair labor practice strikers for remedial purposes. (See discussion supra, Part Three, I,D,4.) In this regard and according to the principles set forth in *Abilities & Good Will, Inc.*, 241 NLRB 27 (1979),[234] backpay for unfair labor practice strikers who are unlawfully discharged runs from the date of their discriminatory discharge. In the present case, the Respondent did not, technically speaking, discharge the striking employees. However, as discussed above, the special protections of Section 502, which shield employees who protest abnormally dangerous working conditions from any penalty, preclude both discharge and permanent replacement, for such actions are indistinguishable in their inhibiting effects. Therefore, the principles announced in *Abilities and Goodwill*, supra, are as applicable to backpay remedies here as they are in cases involving conventional discriminatory discharges. While some uncertainty exists as to the precise date on which each striker was replaced, any ambiguity in this regard may be resolved at the compliance stage of this proceeding. Similarly, determinations as to the amount of backpay owed, if any, to employees who were lawfully discharged for strike misconduct or who obtained regular and substantially equivalent employment elsewhere shall be deferred to a compliance proceeding.

Accordingly, having found that the Respondent engaged in unfair labor practices violative of Section 8(a)(3) and (1) of the Act, the proposed Order shall recommend that Respond-

[234] Enf. denied on other grounds 612 F.2d 6 (1st Cir. 1979).

ent cease and desist therefrom and take certain affirmative action designed to effectuate fully the purposes of the Act. Specifically, Respondent shall be ordered to offer reinstatement to all eligible employees who participated in the Section 502 work stoppage to their former jobs o,r if no such jobs exist, to substantially equivalent positions, without prejudice to their seniority, or other rights and privileges previously enjoyed. Respondent also shall make these employees whole for any loss of earnings they may have suffered because of discrimination practiced against them by payment to them of a sum of money equal to that which they normally would have earned from the date of the discrimination to the date Respondent offers reinstatement, less net earnings during that period. Backpay shall be computed in the manner set forth in *F. W. Woolworth Co.*, 90 NLRB 289 (1950), with interest as prescribed in *Florida Steel Corp.*, 241 NLRB 651 (1977).[235]

Having found that Respondent also violated 8(a)(5) and (1) of the Act by refusing to bargain collectively with the Union since on or about May 4, 1982, Respondent shall be ordered on request, to resume bargaining in good faith with the Oil, Chemical and Atomic Workers International Union, AFL–CIO, and to incorporate any understanding which may be reached in an executed agreement. The Order also shall direct Respondent to desist making coercive statements to its work force regarding the seniority status of reinstated strikers.

Because a considerable number of years have elapsed since the work stoppage commenced, during which time Respondent has physically enlarged and altered its facility, and because records for a significant number of employees must be adduced, problems could arise in producing documentation needed to assure compliance with a remedial order. Therefore, the General Counsel's request for visitorial rights shall be granted thereby enabling the Board to engage in discovery under the Federal Rules of Civil Procedure so that it may better monitor compliance with its Order.

[235] See generally *Isis Plumbing Co.*, 138 NLRB 716 (1962).

CONCLUSIONS OF LAW

1. The Respondent, TNS, Inc., is an employer within the meaning of Section 2(2), (6), and (7) of the Act.

2. The Charging Party, Oil, Chemical and Atomic Workers International Union, AFL–CIO (OCAW), is a labor organization within the meaning of Section 2(5) of the Act and at all times material herein has been the exclusive bargaining representative of all hourly paid production and maintenance employees employed at Respondent's Jonesboro, Tennessee facility, excluding all office clerical employees, professional employees, guards and supervisors as defined in the Act.

3. Employees in the above-described unit ceased work concertedly and engaged in a work stoppage commencing on May 1, 1981, based on their good-faith belief that working conditions at their place of employment were abnormally dangerous by virtue of long-term exposure to unprecedented levels of uranium dust, in conjunction with Respondent's inadequate health and safety program.

4. The employees' good-faith belief that their working conditions were abnormally dangerous was supported by a preponderance of competent objective evidence on the record as a whole.

5. The employees' work stoppage commencing on May 1, 1981, and concluding on February 15, 1982, was not a strike within the meaning of Section 502 of the Act.

6. By permanently replacing the employees who engaged in a work stoppage under Section 502, and refusing to immediately reinstate them after OCAW submitted an unconditional offer to return to work on their behalf on February 15, 1982, Respondent violated Section 8(a)(3) and (1) of the Act.

7. By assuring its work force on an unspecified date in 1983 that the former strikers would not be reinstated with their seniority rights intact, and subsequently retracting such assurances, Respondent interfered with, coerced and restrained the employees in their exercise of Section 7 rights, thereby independently violating Section 8(a)(1) of the Act.

8. Respondent's refusal to meet and bargain collectively with OCAW since on or about October 29, 1982, is violative of Section 8(a)(1) and (5) of the Act.

[Recommended Order omitted from publication.]